DIVERSIFICATION, DERIVATIVE USAGE, AND FIRM VALUE

By

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To my wife (Deborah), and my parents (Larry and Marcella)

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This dissertation investigates the connection between firm diversification, derivative usage and their effects on firm excess value. First, we calculate the value of corporate diversification on the level of capital market development. With a sample of more than 8,000 firms from 35 countries during 1991-1995, we find that the value of corporate diversification is negatively related to the level of capital market development. We also find that the value of corporate diversification varies with the legal system.

Second, we provide evidence on the value of product and geographic diversification and their impact on firm excess value. We collect data on more than 4,000 firms from four countries (Germany, Japan, the U.K., and the U.S.), from 1991-1995, and find that U.S. and Japanese multinationals trade at a higher value relative to a domestic firm operating with the same product mix. However, we find that multinationals do no better than a comparable international portfolio of firms in their respective domestic market.

Finally, we evaluate the effects of derivative usage on firm excess value as well as the interactions among derivative usage, product diversification, geographic diversification, and firm excess value. With a sample of more than 1,600 firms from the U.S., from 1991-1995, we find a

value loss for industrially diversified firms that use derivatives, with the greatest loss occurring for large diversified firms. Results that differentiate between expected and unexpected derivative usage and control for individual firm characteristics suggest that the value loss is associated with unexpected derivative usage by industrially diversified firms.

CHAPTER 1
INTRODUCTION

The issue of corporate diversification and firm value has generated substantial interest in recent years. Potential benefits may include operating synergies, and the ability to effectively allocate scarce capital through an internal capital market. Costs may include increased agency conflicts, which may lead to increased costs. The empirical evidence, however, appears to indicate that firms that industrially diversify, at least in the U.S., perform worse relative to firms that are concentrated in one line of business. The main reason attributed to the empirical findings is that diversified firms may encounter greater agency conflicts and consequently more costs than a firm with a focused organizational structure. The connection between corporate diversification and firm value is less obvious outside the U.S. because it is unclear that these potential agency costs are similar across countries and legal systems.

There is also the issue of product and geographic diversification and their effect on firm value. International diversification may allow firms to capitalize on operating and financial synergies, and capture possible growth opportunities. The potential benefits may also include portfolio diversification for shareholders. However, this benefit may not accrue to the multinational itself. The potential costs may include additional costs from managing more resources, increased political and exchange rate risks, and foreign government intervention. The empirical evidence is mixed and inconclusive. Therefore, the effect of international diversification on firm value is uncertain.

The third issue is derivative usage, diversification, and their effect on firm value. Derivative instruments may allow firms to control for the costs and the risks associated with diversification. The theoretical evidence determines firms may use derivative instruments for tax motives, reduction in bankruptcy costs, and leverage, asymmetric information and moral hazard

stories among others. The empirical evidence mainly supports the theoretical evidence for derivative usage by firms. Evidence regarding the direct effect of derivative usage and firm value is not as comprehensive. This can be attributed to the lack of detailed historical reporting of derivative instruments by firms. The potential benefits of derivative usage may include cash flow smoothing, increased debt capacity, and risk transfer, among others. Potential costs may include increased agency conflicts when using derivatives, and increased risks. Some empirical evidence indicates an increase in firm value when using derivative instruments. Although it appears that more research is needed before resolving that derivative usage is positively related to firm value.

This dissertation explores the connection between firm excess value, diversification, and derivative usage. First, we calculate the value of product diversification on the level of capital market development. We examine a sample of more than 8,000 firms from 35 countries during 1991-1995. We observe that the value of corporate diversification is inversely related to the level of capital market development. We also uncover that the value of product diversification varies with the legal system. These results suggest that the financial, legal, and regulatory environment all have a significant influence on the value of product diversification, and that the optimal organizational structure for firms operating in emerging markets may be unrelated to those firms operating in more developed economies.

Second, we provide evidence on the value of product and geographic diversification and its impact on firm excess value. The sample consists of more than 4,000 firms from four countries (Germany, Japan, the U.K., and the U.S.), from 1991-1995. Our regression analysis controls for the firm's size, profitability, capital intensity, and ownership structure. We find that the U.S. and Japanese multinationals outperform the domestic firms operating within the same line of business. However, we find that multinationals in each country do not outperform an international portfolio of firms in each of their domestic markets. These results are consistent with the international investments literature which suggest that shareholders can earn an

equivalent risk-adjusted return from a multinational by holding a portfolio of domestic firms in each international market.

Finally, we evaluate the effects of derivative usage on firm excess value as well as the interactions among derivative usage, product diversification, geographic diversification, and firm excess value. With a sample of more than 1,600 firms from the U.S., from 1991-1995, we find that focused firms that use derivative instruments have higher unconditional average excess values than diversified firms that do not use them. After using regression procedures that control for firm characteristics including firm profitability, growth opportunities, size, leverage, dividend structure, and ownership concentration, we also find that the value loss is larger for industrially diversified firms that use derivatives, with the greatest loss occurring for large diversified firms. These results are consistent with greater agency costs in large, diversified firms. Interestingly, results that differentiate between expected and unexpected derivative usage and control for individual firm characteristics suggest that the value loss is associated with unexpected derivative usage by industrially diversified firms. These findings also suggest that when firms use derivatives as expected, there are no valuation effects.

CHAPTER 2
FIRM VALUE AND CAPITAL MARKET DEVELOPMENT

Introduction

The connection between corporate diversification and firm value continues to generate substantial interest among financial theorists and practitioners. Recent evidence suggests that diversified U.S. firms trade at discounts compared to firms that are more focused [e.g., Lang and Stulz (1994), Berger and Ofek (1995), John and Ofek (1995), and Comment and Jarrell (1995)].[1] One explanation for these findings is that diversified firms face higher agency costs as a consequence of their organizational form. For example, recent papers have argued that intra-firm coordination problems are likely to be more extensive for diversified firms, because of their need to allocate capital among their various disparate activities [e.g., Rajan and Zingales (1996b) Scharfstein and Stein (1997), and Scharfstein (1998)].[2]

Despite the observed costs arising from corporate diversification, there is theoretical work that suggests that there may also be benefits from diversification. In particular, work by Williamson (1975), Gertner, Scharfstein and Stein (1994), Harris and Raviv (1996), and Stein (1997) suggests that capital constrained firms may establish internal capital markets that are able to effectively allocate scarce capital within the firm.[3] Recent empirical evidence documents that there are systematic patterns in the internal allocation of capital in diversified firms [e.g., Shin

[1] These results are also consistent with the evidence that corporate spin-offs generally enhance shareholder value [see, for example, Hite and Owers (1983), Schipper and Smith (1983), and Kaplan and Weisbach (1992)].

[2] Denis, Denis and Sarin (1997) argue that value-reducing diversification strategies are sustained over time because they benefit managers (at the expense of shareholders), but that a competitive corporate control market may spur many firms to increase their focus.

[3] It is interesting to note, however, that Stein's model actually implies that internal capital markets may work best among firms that are more focussed.

and Stulz (1997), Lamont (1997), Houston, James and Marcus (1997), and Scharfstein (1998)], but it remains an open question whether this allocation works to increase or decrease shareholder value.

It also remains an open question whether or not the extant empirical evidence extends beyond the results reported for U.S. firms. On one level, the agency costs accompanying diversification may vary systematically across countries and legal systems. At the same time, Khanna and Palepu (1997) argue that the relative costs and benefits of corporate diversification depend critically on the "institutional context" in which the firm operates. The institutional context includes the financial, legal, and regulatory environment. In a similar vein, LaPorta, Lopez-De-Silanes, Shleifer, and Vishny (1997) show that different legal systems provide investors with varying degrees of protection which, in turn, affect the level of economic and capital market development.[4] These results also suggest that the value of corporate diversification is related to the legal system. While diversification may have limited value in a developed economy such as the U.S. where the institutional context enables smaller, stand-alone firms to raise capital, it may be more valuable for firms who find it costly or impossible to raise external capital, either because of imperfect information or incomplete capital markets.[5]

A firm's access to external capital depends on its ability to obtain domestic and/or foreign capital. Consequently, the extent to which capital markets are developed within the country where the firm operates, and the extent to which that country is able and/or willing to attract foreign capital, will both have a strong influence on a firm's ability to raise capital. We would expect that internal capital markets are most valuable among firms and economies where it is

[4] Demirgüc-Kunt, and Maksimovic (1996) also find that legal systems affect growth rates and the ability to enter into long-term financial contracts. Desai (1997), moreover, finds that multinational firms employ internal capital markets to overcome the higher costs of external finance associated with weaker creditor rights in lesser developed markets.

[5] The economic and legal environment in less developed markets may also make it more difficult to contract with other firms, and therefore, may provide an additional benefit to diversification. Another potentially important benefit from diversification is the relatively high level of political influence that conglomerates and business groups wield in less developed markets. These political connections can create differential access to resources and markets.

costly to obtain external capital. Therefore, unless the agency costs accompanying diversification are significantly higher in these countries, we would expect that the benefits from diversification would be higher in countries where capital markets are less developed and where legal systems provide limited protection to investors. If this conjecture is correct, it raises the possibility that the results indicating a diversification discount for the U.S. do not generalize to other countries where external capital markets are less developed.[6] In particular, we would expect to see smaller diversification discounts, and perhaps even diversification premiums, among firms that operate in less developed markets.

To date, the international evidence regarding corporate diversification has been limited. One notable exception is the recent work by Lins and Servaes (1999). Looking at a sample of firms from Germany, Japan, and the United Kingdom in 1992 and 1994, they report valuation discounts that are of similar magnitude to those reported for U.S. firms. Moreover, their estimated diversification discounts remain statistically significant for Japan and the United Kingdom even after controlling for firm characteristics. In Germany, after controlling for firm characteristics, they also report a diversification discount, but it is not statistically different from zero.[7]

Also notable is the recent work by Khanna and Palepu (1997). They argue that diversification may be more valuable in emerging markets than in more developed economies. Khanna and Palepu's analysis focuses on diversified business groups within India. They find that larger diversified groups that are in a better position to tap external capital outperform smaller

[6] This argument might also suggest that the value of diversification within a given country may decline over time as the country's capital markets become more developed. Servaes (1996), Klein (1998), and Hubbard and Palia (1998) have examined this issue by considering the value of diversification in the U.S. during the conglomerate wave of the 1960s.

[7] In a more recent paper, Lins and Servaes (1998) use data from 1995 to investigate the value of corporate diversification for Hong Kong, India, Indonesia, Malaysia, Singapore, South Korea, and Thailand. They find that for six of their seven countries, there is no statistically significant diversification discount -- only for South Korea did they find a diversification discount that was statistically different from zero.

unaffiliated firms. Khanna and Palepu's study provides some indirect support for our hypothesis that the value of diversification depends critically on the level of capital market development.

In this paper, we investigate the link between capital market development and the value of corporate diversification. To address this issue more extensively, we have assembled a large data set that consists of more than 8,000 firms from 35 countries over a five-year period between 1991 and 1995. Using the methodology employed by Berger and Ofek (1995) and Lins and Servaes (1999), we calculate the implied value gain or loss from diversification. In addition, we test whether the gain or loss that results from diversification is systematically related to the level of capital market development.

Our results provide evidence that the value of diversification is related to the degree of capital market development. In particular, after controlling for the legal environment in which the firm operates and firm-specific factors such as firm size, capital structure, profitability, and ownership structure, we find that the value of diversification varies with the degree of capital market development. Among high-income countries, where capital markets are well developed, we find a statistically significant diversification discount. This finding is consistent with the U.S. evidence and the international evidence presented by Lins and Servaes (1999). By contrast, for the lower income countries, we find that there is either a significant diversification premium or no diversification discount. For these firms, the benefits of diversification appear to offset the agency costs of diversification. These results are consistent with Khanna and Palepu's evidence from Indian business groups.

We also find that the diversification discount systematically varies with the legal system. LaPorta, Lopez-De-Silanes, Shleifer, and Vishny (LLSV, 1997) document that the English legal system provides the most protection to capital providers. If this protection results in better access to external capital, the benefits of internal capital markets and corporate diversification may arguably be smaller in countries that operate under a legal system with English origin. Consistent with this argument, we find that diversification discounts are largest among countries where the

legal system is of English origin. We find smaller diversification discounts in countries where the legal system is of a German, Scandinavian, or French origin.

Lastly, we find that our results are robust with respect to controlling for the agency costs associated with concentrated ownership, differences in accounting rules across countries, and various measures of capital market development and the legal environment.

The rest of the paper proceeds as follows. The next section reviews the connection between capital market development, economic development, and legal systems. We also describe the various economic development classifications and legal systems for each of the 35 countries in our sample. The third section describes our data and the methodology used to calculate the value of corporate diversification. The cross-country mean estimates of the value of corporate diversification are presented in the fourth section. Regression results regarding the value of diversification after controlling for firm-specific characteristics are presented in section five. In section five, we also provide a number of robustness tests, including the effects of controlling for cross-firm and cross-country differences in accounting practices. Section six examines the links between the value of diversification and ownership structure, while section seven provides a conclusion.

Corporate Diversification and Capital Market Development

One clear drawback of corporate diversification is that it creates another layer of potential agency problems within the firm. Internal politics and imperfect information within the firm may complicate the ability of senior managers to effectively allocate capital among the various lines of business that exist within a conglomerate [see, for instance, Rajan and Zingales (1996b), Scharfstein and Stein (1997), and Scharfstein (1998)]. Despite these costs, corporate diversification may still be beneficial. In some cases, combining different lines of business within the same organization may generate value-creating operating synergies. Diversification may also create financial synergies to the extent it reduces the cost of obtaining capital [see, for

instance, Lewellen (1971), Stein (1997), Williamson (1975) and Hadlock, Ryngaert and Thomas (1998)].

The financial synergies arising from diversification are likely to vary with the level of capital market development. For example, Rajan and Zingales (1996a) suggest that there are important cross-country differences in access to capital markets. They demonstrate that the development of a country's financial sector reduces the cost of external finance. In demonstrating a link between financial development and economic growth, they show that firms operating in industries which are generally more reliant on external finance grow faster if they are established in a country that has a more developed financial system. These results are consistent with our main hypothesis that the value of diversification is greater in countries where capital markets are less developed.

At the same time, the agency costs of diversification are also likely to vary across firms and across countries. While it is difficult to directly measure these agency costs, a long-standing literature suggests that these costs (and therefore ultimately firm value) may be correlated with ownership structure [see, for example, Demsetz and Lehn (1985), Morck, Shleifer and Vishny (1988), Holderness and Sheehan (1988), and McConnell and Servaes (1990)]. Moreover, recent work by La Porta, Lopez-de-Silanes, and Shleifer (1999) and by Claessens, Djankov, Fan and Lang (1998) indicate that ownership structure as well as the correlation between ownership structure and firm value, vary across countries and legal systems. While ownership concentration is likely to affect firm value, it remains an open question whether it also has an effect on the value of corporate diversification. In Section VI, we address the agency costs of diversification by explicitly controlling for ownership concentration among the subset of firms where these data are available.

Another factor that may attenuate the link between the value of corporate diversification and the degree of capital market development is the increased integration of global capital markets in recent years. Indeed, if capital markets are perfectly integrated, we would expect that

firms would be able to access external capital at the global cost of capital, even if the financial sector is less developed in the country in which they operate. Empirical studies on the degree of capital market integration performed for various markets and under varying assumptions have yielded mixed results [see, for instance, Jorion and Schwartz (1986), Cho, Eun and Senbet (1986), Wheatley (1988), Gultekin, Gultekin and Penati (1989), Mittoo (1992), Chen and Knez (1995), Bekaert and Harvey (1995), Naranjo and Protopapadakis (1997), and Stulz (1999)]. Given these mixed results, the link between capital market development and the value of corporate diversification is ultimately an empirical question.

In order to test our main hypothesis, we need to measure capital market development across countries. Capital market development can be measured in a variety of ways including per-capita GNP, equity market capitalization relative to GNP, the number and dollar amount of per-capita initial public offerings, the ratio of public and private debt to GNP, and the relative size of the banking system.[8] In our analysis, we rely on recent research which demonstrates that there is a strong link between capital market development and economic development [see, for example, Levine (1997), King and Levine (1993a, 1993b) and Rajan and Zingales (1996a)]. While the causation may be unclear, countries with higher levels of economic development (on the basis of traditional measures such as per-capita GNP) are likely to have a more extensive domestic capital markets and are also more likely or willing to obtain foreign capital.[9]

We primarily use two proxies to test whether capital market development influences the value of corporate diversification. First, relying on the link between capital market development

[8] King and Levine (1993a), Rajan and Zingales (1996a), and LaPorta, Lopez-De-Silanes, Shleifer, and Vishny (1997) provide a more detailed discussion of these capital market development measures. The problem with many of these measures is a lack of comprehensive data. Furthermore, some of these other measures may provide a misleading depiction of the accessibility of external capital. For example, measures of equity market capitalization relative to GNP are typically low for many European countries, but most would argue that European firms have good access to external financial markets.

[9] One potential problem with using per-capita GNP as a measure of capital market development is that some countries with vast natural resources may demonstrate high per-capita GNP, even though firms that operate in these markets have limited accessibility to external capital. None of the countries in our sample, however, fall into this category.

and economic development, we use the World Bank's classification of economic development as a proxy for capital market development. Each year, the World Bank classifies countries into four categories: high income, upper-middle income, lower-middle income, and low income. This classification is largely based on the country's per-capita GNP. With this in mind, we also employ the country's per-capita GNP itself as a proxy for capital market development.[10]

In addition to these proxies, we also control for the country's legal system to take into account the evidence by LaPorta, Lopez-De-Silanes, Shleifer, and Vishny (1997, 1998), which documents a link between legal systems and capital market development. LLSV classify countries into four different legal systems: those with English, French, German, and Scandinavian origin.[11] Their evidence suggests that a country's legal system significantly affects the level of protection that is given to investors, which in turn affects the availability of external capital. In particular, they find that the English system, with its common law origin, provides investors with the strongest legal protection, while the French legal system provides the least protection. They also argue that countries whose legal system is of German or Scandinavian origin have a moderate level of investor protection, falling somewhere between the English and French systems. Controlling for economic development, we would therefore expect that diversification discounts would be largest among countries with an English legal system, since firms in these countries are likely to have better access to external capital markets.

Table 2-1 summarizes the economic development and legal system classifications for each of the 35 countries in our sample. We use the legal classifications reported in LLSV. The average per-capita GNP is the five-year arithmetic average over our sample period, 1991-1995.

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[10] As additional measures of capital market development, we also use for each country the ratio of the stock market capitalization held by minorities plus the sum of bank debt of the private sector and outstanding non-financial bonds to GNP (MKTCAP + Debt/GNP), the ratio of the number of domestic firms listed in a given country to its population (Domestic Firms/Pop), and the ratio of the number of the initial public offerings of equity in a given country to its population (IPOs/Pop). These data are obtained from LaPorta, Lopez-De-Silanes, Shleifer, and Vishny (1997). See Section V, sub-section C.

[11] From LLSV, we also obtain the law and order tradition (Rule of Law) in each country. See Section V, sub-section C.

This measure ranges from $316 in India to $36,800 in Switzerland. As indicated above, the World Bank classification largely coincides with per-capita GNP.

Data

Sample Construction

Our main data source is the Worldscope database.[12] Worldscope has complete financial data and business segment data for more than 8,000 companies, located in 49 countries. The firms in the databank represent 86 percent of global market capitalization. The business segment data start in 1991. For this reason, our sample period begins in 1991 and extends through 1995.[13] We use the reported business segment data to classify the publicly traded firms as either single-segment (focused) or multi-segment (diversified). We classify firms as single-segment firms if they operate in only one two-digit SIC code industry. Firms are classified as multi-segment if they have more than one reported segment, and the largest segment has less than 90 percent of the total sales for the company.

Within each country, we exclude multi-segment firms from the sample if the company does not report sales at the individual segment level. However, in cases where individual segment sales are not reported and there is only one primary reported SIC, we classify the firm as a single-segment firm and use the firm's total sales.[14] We also exclude firms whose *primary* business is financial services (i.e., where more than fifty percent of firm sales come from SICs in the 6000-6999 range). These firms are excluded because sales figures are irregularly reported and are difficult to interpret for financial institutions. Finally, we exclude firms where there are no pure play matches and corresponding segment sales exceed 25 percent of total sales. For 14 of

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[12] This databank is also used by LaPorta, Lopez-De-Silanes, Shleifer, and Vishny (1997, 1998), Lins and Servaes (1999), Claessens, Djankov, Fan and Lang (1998), and LaPorta, Lopez-De-Silanes and Shleifer (1999).

[13] We wish to thank Worldscope for providing us with machine-readable access to their databank.

[14] Due to data limitations, we are unable to disentangle firms that may be diversified, but only report one line of business.

the 49 countries, there were insufficient data to calculate the estimated value of diversification, leaving 35 countries with sufficient data.[15,16]

Summary Statistics

Table 2-2 reports firm level summary statistics broken down by the level of economic development and the legal system in which the firm is headquartered. Panel A divides the firms according to their country's World Bank classification. Across the four classifications, diversified firms have a mean number of segments varying from just over 2.5 segments in the high-income countries to just under 3 segments in the upper-middle income countries. In virtually all cases, diversified firms are significantly larger than the focused firms in terms of both total assets and total capital. We also find that there is no consistent distinction in the leverage ratios between the single and multi-segment firms in our sample.[17]

Looking at the firm level characteristics for the high-income country group, we find that single-segment firms have a higher average market-to-sales ratio. This evidence is consistent with the results of Lang and Stulz (1994), Berger and Ofek (1995), and Lins and Servaes (1999), and provides broad evidence suggesting that single-segment firms are valued more highly than

[15] We also exclude firms where the actual value (imputed value) is more than four (one-fourth) times the imputed value (actual value) – see Section IV, sub-section A. Firms are primarily excluded from our sample according to the following two screens: firms whose primary business is financial services and firms where the actual value (imputed value) is more than four (one fourth) times the imputed value (actual value). These two screens account for 87 percent of the firms eliminated from our sample, while only 2 percent of the firms are excluded from our sample due to multi-segment firms that do not report sales at the individual segment level.

[16] Our sampling procedure differs from Lins and Servaes' (1999) in three ways. First, they exclude service firms – the reason being that were relatively few service firms in Germany, and they wanted to control for industry differences across the three countries that they were investigating. In our study, we have chosen to include the broadest possible sample of firms and countries. Second, Lins and Servaes also exclude firms that do not trade on the country's main exchange. Third, to keep the data collection process manageable, Lins and Servaes only use a random sample of 450 firms from Japan and the United Kingdom in 1992 and 1994, whereas we use all firms in the databank that meet our screens. While our sampling procedure is somewhat different, the estimated diversification discounts that we find for Japan, Germany, and the United Kingdom are quite similar to those reported by Lins and Servaes (1999).

[17] Lins and Servaes (1999) also find no distinction in leverage ratios between focused and diversified firms, while Lewellen (1971), Kim and McConnell (1977), Comment and Jarrell (1995), and Berger and Ofek (1995) find that diversified U.S. firms have higher debt ratios.

diversified firms. However, this result does not generalize to the lesser-developed countries. In two of the other three classifications (upper-middle and low-income), the diversified firms have a median market-to-sales ratio that is higher than that found for the focused firms. For the other two ratios, operating income-to-sales and capital expenditure-to-sales, there is no significant distinction between the single and multi-segment firms.

In Panel B, the firms are divided according to the legal system of the country in which they are headquartered. Once again, the results indicate that diversified firms are generally larger, although this difference does not appear to be significant for countries with a French legal system. Consistent with the results reported earlier, diversified firms generally have a lower market-to-sales ratio, which again provides indirect evidence that diversified firms trade at a discount relative to focused firms. We address this issue more completely in the next section where we directly estimate the value of diversification.

Methodology

Estimating the Value of Corporate Diversification

To estimate the value of corporate diversification, we modify the approach originally used by Berger and Ofek (1995). In our analysis, we use the ratio of total-capital-to-sales to measure corporate performance, where total capital is calculated by adding the market value of equity to the book value of debt. Along with this measure, Berger and Ofek (1995) also consider two other ratios to measure performance: the ratio of total-capital-to-assets and the ratio of total-capital-to-earnings. Their qualitative results are similar for each of the three performance measures. We are unable to use these alternative measures because there is very little business segment data regarding assets or earnings for the non-U.S. firms.[18]

We calculate the excess value of each firm by taking the difference between the firm's actual performance and its imputed performance. Actual performance is measured by the consolidated firm's capital-to-sales ratio. For single-segment firms, imputed value is calculated

[18] For similar reasons, Lins and Servaes (1999) also use the capital-to-sales-ratio as their sole measure of performance.

as the median capital-to-sales ratio among all pure-play (single-segment firms) within the same industry and same country. For multi-segment firms, imputed value is calculated by taking a weighted-average of the imputed values for each of the firm's segments, where the weights reflect the proportion of the overall firm's sales that come from each segment. Multi-segment firms have a positive excess value (i.e., a premium) if the overall company's value is greater than the "sum of the parts." By contrast, multi-segment firms have a negative excess value if their value is less than the imputed value that would be obtained by taking a portfolio of pure-play firms that operate in the same industries and country as the diversified firm.[19]

We define industries at the two-digit SIC code level.[20] In cases where there are no other two-digit pure-plays firms to match from, we calculate the imputed market capital-to-sales ratio using broader industry classifications defined by Campbell (1996).[21] Finally, to avoid having the results driven by extreme values, we exclude firms where the actual value is more than four times the imputed value, or where the imputed value is more than four times the actual value.[22]

The Value of Diversification

Table 2-3 reports the excess value estimates for the single and multi-segment firms in our sample. Once again, the firms are classified according to each country's legal system and the World Bank's classification of economic development for each country.

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[19] The average number of pure-plays ranges from 1.30 in New Zealand to 29.44 in the U.S., while the average number of pure-plays in the less developed markets is 3.02. To further insure that our results are robust with respect to the control groups, we also increased the required minimum number of pure-play matches to three firms and obtained similar results, but with a considerably smaller sample.

[20] While this two-digit classification is somewhat coarse, it provides us with a larger number of pure play firms. Increasing the number of pure-plays is particularly important in the less developed markets. Lins and Servaes (1999) and others also use a similar approach.

[21] The reported results are essentially the same if we eliminate firms from the sample that do not have a two-digit pure-play match.

[22] Berger and Ofek (1995) and Lins and Servaes (1999) also use this screen. When we use a more conservative screen of excluding firms where the actual value (imputed value) exceeds the imputed value (actual value) by a factor of three, we obtain similar results.

The results in Panel A, where the firms are divided according to the World Bank classification, strongly suggest that the value of diversification is negatively correlated with the degree of economic development. Diversified firms in the most developed nations trade at a significant discount relative to focused firms. The median discount for the high-income group is 5.76 percent. By contrast, diversified firms in the low-income group trade at a significant *premium* of 3.80 percent relative to focused firms. This finding suggests that diversification may create net benefits among firms that operate in countries whose capital markets are not fully developed, which is consistent with the evidence from Indian business groups reported by Khanna and Palepu (1997).

One potential concern with the World Bank classification is that there are relatively few firms (particularly diversified firms) within the lower income groupings, and these firms come from a relatively small number of countries. For example, there are only three countries in our sample that are in the low-income group – China, India, and Pakistan. A concern that arises is that it may be difficult to sort out whether any demonstrated effects for this group are due to its low-level development, or to other country-specific factors. While we control for these effects more completely in the subsequent regression analysis, another way to get at this issue is to broaden the categories of economic development. Thus, in Panel B, we report similar excess values, but the countries are divided more broadly according to their per-capita GNP. In this classification, the lowest grouping also includes firms operating in Indonesia and the Philippines.

In Panel B, the mean and median excess values, using the broader per-capita GNP groupings, are very similar to statistics reported in Panel A using the World Bank classifications. Once again, the value of diversification varies with the level of economic development. Firms that operate in countries with a per-capita GNP in excess of $15,000 have a mean diversification discount of 5.79 percent and a median discount of 5.78 percent. The results are also strikingly different for firms headquartered in the emerging market countries. Among these firms, we find a mean diversification premium of 8.41 percent and a median premium of 5.41 percent. The

similarity between Panel A and Panel B confirms that the World Bank classifications are largely driven by differences in per-capita GNP.

In Panel C, we classify firms according to their country's legal system. The results indicate that diversified firms trade at substantial discounts if they operate in a country with a legal system of English origin. Among these countries, the median discount is 8.57 percent. Among the other countries in our sample with French, German, and Scandinavian legal origin, we find no evidence of either a diversification discount or premium. These results complement the evidence reported by LLSV (1997). Their results suggest that the English legal system provides the most protection to external investors which generally leads to more developed capital markets. Our results suggest that the value of internal capital markets is smallest when capital markets are most developed.

Results

The results reported in Table 2-3 suggest that the degree of capital market development affects the value of corporate diversification. While these results provide an overall depiction of the value of diversification among various countries, they do not control for individual firm characteristics, which may also affect the firm's market-to-sales ratio. These other characteristics include the firm's size, profitability, and future growth opportunities. To control for these factors, we estimate the following regression model for each of the thirty-five individual countries in our sample:[23]

$$(1)\ Excess\ Value = \alpha + \beta_1(Diversification\ Dummy) + \beta_2(Log\ Assets) + \beta_3(Operating\ Income / Sales) + \beta_4(Capital\ Expenditures / Sales) + e.$$

Excess value is defined to be the natural log of the ratio of the firm's market value to its imputed value. The diversification dummy (SEG) is equal to one for multi-segment firms and is otherwise zero. The log of assets controls for potential firm size effects. The ratio of operating income-to-sales (OIS) provides a measure of firm profitability, while the ratio of capital

[23] Lang and Stulz (1994), Berger and Ofek (1995), and Lins and Servaes (1999) also estimate similar models.

expenditures-to-sales (CES) proxies for the level of growth opportunities. Controlling for the other factors, we would expect to see a positive link between excess value and both OIS and CES. Since our data cover five years (1991-1995), we also include separate year dummies in the regressions to control for intertemporal variations in market or economic conditions that may also affect the firm's market-to-sales ratio.

Regression Results for the Individual Countries

The regression results for the individual countries are reported in Table 2-4. In 23 of the 35 countries, the estimated coefficient on the diversification dummy variable is negative. In 11 of these 23 countries, the coefficient is statistically significant, suggesting a diversification discount. In 12 of the 35 countries the coefficient is positive. In 4 of the 12 cases (Hong Kong, Norway, Pakistan and Singapore), this coefficient is positive and statistically significant, suggesting that there is a diversification premium for these countries, after controlling for the firm-level characteristics.

As expected, we find that the estimated coefficients on the OIS (Operating Income/Sales) and CES (Capital Expenditures/Sales) variables are generally positive and frequently significant. These results confirm that firms that are more profitable and that have greater growth opportunities typically have higher market-to-sales ratios. The signs on the estimated coefficients for the log of asset variable vary considerably across the different countries. The previous evidence on this variable is also mixed – Berger and Ofek (1995) find a positive link between firm size and firm value, while Lang and Stulz (1994) and Lins and Servaes (1999) find a negative relation. Although not reported, the annual dummy coefficients indicate that there is little time variation in the excess values, after controlling for firm characteristics.

The estimated coefficients on the diversification dummy appear to be reasonable and are generally well within the ranges found in earlier studies. Among U.S. firms, we find a diversification discount of 13.2 percent, which is similar to the 14.4 percent found by Berger and Ofek (1995) over an earlier time period 1986-1991. For Germany, we find no evidence of a

statistically significant diversification discount or premium, confirming the conclusions reached by Lins and Servaes (1999). Lins and Servaes also found a diversification discount for Japan of roughly 10 percent for both 1992 and 1994. Looking at a broader set of firms, we find a statistically significant diversification discount for Japan of 4 percent, which is smaller than their estimate.[24] Likewise, for the United Kingdom, Lins and Servaes (1999) found a 15 percent discount. Looking at a significantly larger sample, we also find a discount for the United Kingdom. Our estimated discount of 7 percent is smaller, but it remains highly significant.

As indicated above, most of the other diversification coefficients appear to be of a similar magnitude to those reported for the United States, Japan, Germany and the United Kingdom. However, the point estimates for a couple of countries do stand out. For example, the diversification discount in Turkey is relatively large and marginally statistically significant, while in Spain the discount is both relatively large and significant at the 1 percent level. At the other extreme, we find a large diversification premium in both Pakistan and the Philippines, although the premium for the Philippines is not statistically different from zero. While in each of these cases the magnitude of the estimates appears to be large, the existence of a diversification discount or premium is generally consistent with our predictions.

When we pool the firms in our sample along two dimensions related to the capital market development of the country in which the firms are headquartered (the World Bank's classification of development and the country's legal system), we find that there is a significant diversification discount of 8.2 percent among the high-income countries.[25] Interestingly, however, there is no evidence of a significant diversification discount or premium for the firms that are not headquartered in a high-income country. For these firms, it appears that the benefits of

[24] Lins and Servaes' (1999) estimates for Japan did not include CES because many Japanese firms did not report CES. We obtain results that are more similar to Lins and Servaes when we also eliminate the CES criterion.

[25] This result is consistent with the findings of Berger and Ofek (1995), Lang and Stulz (1994), and Lins and Servaes (1999), and also reaffirms the summary statistics reported in Table 2-3. This coefficient is highly significant with a t-statistic of -10.726.

diversification (operating synergies and the establishment of internal capital markets) roughly offset the costs of diversification. These findings suggest that while corporate focus generally makes sense in highly developed countries, its value may not extend worldwide in cases where external capital markets are less developed. In this regard, our results lend support to the conclusions reached by Khanna and Palepu (1997).

From the pooled legal system results (also not reported), we find that there is a strong relation between the legal system and the value of corporate diversification. In particular, the observed relations are consistent with our priors and are also consistent with the evidence found by LLSV (1997, 1998). We find that diversification significantly reduces value in countries that have a legal system with English, French, or Scandinavian origin. As expected, the value of diversification is most negative for firms that operate in countries with an English legal system. Finally, controlling for OIS, CES, size, and annual variations, we find neither a diversification discount nor premium among the firms that operate in markets with a German legal system.

Firm-level Regression Results

To further test the link between capital market development and the value of diversification, we also estimate firm-level regressions that include all of the firms from each country and for each year of our sample period. In each case, the dependent variable is the firm's excess value. These regressions, reported in Table 2-5, control for the firm-level characteristics outlined above (OIS, CES, and firm size). The regressions also include variables reflecting (1) the level of economic development of the country in which the firm is headquartered as measured by the country's World Bank classification or per-capita GNP; (2) the country's legal system; (3) year dummies to take into account time variation in the value of diversification.

The OLS regression estimates reported in columns (1) – (3) of Table 2-5 and the fixed-effects estimates reported in column (4) are for the full sample of firms (single-segment and multi-segment firms), where the dummy variable, SEG, equals 1 if the firm has multiple segments and equals 0 otherwise. The coefficient on SEG, therefore, indicates the value of

diversification after controlling for the firm-specific, time-specific, and country-specific factors. The regression specification reported in the first column only controls for the firm-specific and time-specific factors. This specification is the same one estimated for the country-level regressions reported in Table 2-4. The second specification, reported in column (2), also includes dummy variables corresponding to the World Bank classification of economic development and the legal system of the country in which the firm is headquartered. In column (3), the regression specification includes the legal system dummy variables and the level of the country's per-capita GNP as a continuous variable alternative to the discrete World Bank classification dummy variables. Column (4) provides fixed-effects estimates of the third specification.

The results indicate that across all firms, diversification has a negative impact on firm value.[26] In column (1), the estimated diversification discount for the full sample of firms is 7.8 percent. When we control for economic development and the legal system with dummy variables, in column (2), the diversification discount for high-income countries with an English legal system is 9.6 percent. Looking at the estimates in column (2), we also see that excess value is significantly higher (at the 5 percent level) if the firm is from a country that is classified as low-income by the World Bank (G1*SEG). In column (3), we also see that the value of diversification is negatively related to per-capita GNP, in that there is a statistically significant negative relation (at the 1 percent level) between excess value and the variable which interacts per-capita GNP with the diversification dummy, SEG. In terms of economic significance, the estimated per-capita GNP coefficient in column (3) implies a discount for the U.S. of 10.5 percent ($-0.426 \times 10^{-5} \times 24{,}758$).[27]

[26] In each case, the adjusted R^2's are somewhat lower than those of the individual country estimates in Table 2-4. While there are clear benefits to pooling the countries, there is also more noise introduced.

[27] As an additional robustness check, we also estimated the regression models corresponding to columns (1) – (4) using only the multi-segment firms. For the multi-segment firm regressions, we included as our measure of diversification the number of segments, SEGN, as an additional explanatory variable in place of SEG. Similarly, in these regressions, each of the interacted variables was interacted with the number of segments (as opposed to interacting with SEG). The results were very similar to those reported for the entire sample. In particular, in all cases there

The legal system dummies are also significantly different from zero, and the estimated coefficients have the predicted signs. In particular, we find that the estimated coefficients are positive for the French, German, and Scandinavian legal dummy variables, indicating that diversification provides greater benefits and/or fewer costs relative to firms that operate in a country with a legal system of English origin. Looking more closely at the estimated coefficient for the legal system dummy variables, we also see that the coefficient for the German legal system is the most positive. This result suggests that after controlling for the other relevant factors, the net costs of diversification are the smallest for firms that operate under the German legal system.

As a robustness check, we also estimate the third specification using fixed-effects.[28] These results are reported in column (4). Similar to the OLS estimates, we find that for the diversified firms there is a statistically significant negative link (at the 1 percent level) between per-capita GNP and excess value. We also find that the German legal system provides the smallest diversification costs. As a further robustness check, we also estimated columns (1)-(3) on a year-by-year basis. Once again, the estimates (not reported) confirm the negative link between per-capita GNP and excess value and the variation of excess value across legal systems.[29]

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was a significant negative correlation between excess value and the number of segments. We also found that the value of diversification was negatively related to per-capita GNP and that the estimated coefficients interacting the diversification variable with the World Bank income group dummies and with the legal system dummies had the same signs, and were generally even more significant than the results reported for the entire sample.

[28] The fixed-effects estimates for the first specification in column (1) are similar to those reported for the OLS estimates. For the second specification in column (2), several of the coefficients can not be estimated using fixed-effects due to singularity of the data. The singularity arises from the inclusion of discrete dummy variables for development and the legal system that persist over time.

[29] The development and legal system results are significant in 1992-1994. In 1995, the results are marginally significant. In 1991, the results are largely insignificant because there are too few low-income country firm observations to get precise estimates.

Additional Proxies for Capital Market Development and the Legal Environment

Up until now, we have primarily used per-capita GNP and legal origin indicator variables as proxies for capital market development and the legal environment. However, it is important that we also employ additional measures in order to insure that our results are robust. LaPorta, Lopez-De-Silanes, Shleifer, and Vishny (1997) analyze several measures of capital market development and the legal environment across 49 countries. In particular, as measures of capital market development for each country, they consider the ratio of the stock market capitalization held by minorities to GNP (External Cap/GNP), the ratio of the sum of bank debt of the private sector and outstanding non-financial bonds to GNP (Debt/GNP), the ratio of the number of domestic firms listed in a given country to its population (Domestic Firms/Pop), and the ratio of the number of the initial public offerings of equity in a given country to its population (IPOs/Pop). LLSV also find that the law and order tradition (Rule of Law) in each country is an important determinant of external finance.

In our regression analysis, we also employ the capital market development and legal environment proxies used by LLSV.[30] These results are shown in Table 2-6. In the first column, we provide firm level OLS regression estimates using the additional proxies, while the second column provides fixed-effects estimates. Interestingly, we find that the coefficient estimates on per-capita GNP, external market capitalization plus debt to GNP, and domestic firms to population are all negative and statistically significant, whereas the coefficient on IPOs to population is not statistically different from zero. We also find that the coefficient estimates on the legal origin indicator variables remain significant, while the coefficient on the Rule of Law variable is not statistically different from zero. It is also interesting to note that the fixed-effects estimates reported in the second column are consistent with the OLS results shown in the first column.

[30] Due to a lack of debt, IPO, and /or Rule of Law data, we lose Australia, China, Hong Kong, Pakistan, Switzerland, and Taiwan from the analysis. If we set the missing observations equal to zero, we obtain similar conclusions.

Due to the high correlation between per-capita GNP and Rule of Law (0.76), we eliminate per-capita GNP from the specification shown in the third column. In this instance, the Rule of Law becomes highly significant, while the remaining coefficient estimates are similar to those reported in the first column. The fixed-effects estimates reported in the fourth column are also consistent with the OLS results where per-capita GNP is eliminated from the specification. All in all, we find that value of corporate diversification varies with the level of capital market development and legal environment.

Accounting Issues

Throughout our analysis, we have used the market-to-sales ratio as a proxy for firm value. One concern is that our results may be biased by cross-country differences in the accounting practices that firms employ when they hold either a majority or minority stake in another firm.[31]

Whenever a parent company owns a majority stake in another firm, the market value of the consolidated firm includes the value of its ownership stake in the subsidiary. However, depending on the accounting practices employed, the sales of the subsidiary may or may not be fully included as part of the company's consolidated sales. For firms that have a controlling stake in another firm, there are two basic methods of preparing consolidated financial statements. Under the proportional method, consolidated sales include only that portion of the subsidiary's sales that reflects the parent's ownership percentage in the subsidiary.[32] In this case, the market-to-sales ratio is not biased. Alternatively, under the full consolidation method, consolidated sales include all of the subsidiary's sales, regardless of the parent's ownership percentage. Clearly, this accounting practice biases downward the market-to-sales ratio. In these circumstances, the net income earned by the minority shareholders is subtracted out of the consolidated firm's total

[31] For examples of the various accounting methods employed across countries, see *International Accounting and Auditing Trends* by the Center for International Financial Analysis & Research, Inc.

[32] When this approach is used, the remainder of the subsidiary's sales is attributed to the minority interest shareholders.

income in order to arrive at consolidated net income. Consequently, whenever the minority shareholders' share of subsidiary sales is a significant portion of consolidated sales, we would expect that the market-to-sales ratio would be biased downward under the full consolidation method.

Another potential problem arises when a company (Company A) owns a minority interest in another company (Company B), but does not choose to include its proportion of Company B's sales on its (Company A's) income statement.[33] In these circumstances, Company A's market-to-sales ratio would be biased upward, since the effects of its ownership in Company B would be included in its market value but not in its sales. In this situation, Company A's income from Company B would show up as investment income from unconsolidated affiliates. Therefore, whenever investment income from unconsolidated affiliates is a significant portion of net income, the market-to-sales ratio is likely to be upward biased.

For our purposes, these accounting biases are particularly important if the magnitude of the biases vary across countries and vary between focused and diversified firms. We find that for 5 of the 35 countries (Denmark, Hong Kong, Indonesia, Italy and Malaysia), diversified firms have a significantly higher proportion of minority interest income as a percentage of sales. The market-to-sales ratios for these countries tend to be biased downward more often for diversified firms, which would bias us towards finding a diversification discount in these countries. For 2 of the 35 countries (France and Switzerland), we find that focused firms have a significantly higher proportion of income from unconsolidated affiliates as a percentage of sales. The market-to-sales ratios for these countries tend to be biased upward more often for single segment firms, which would also bias us towards finding a diversification discount in these countries.

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[33] When a company owns a 20%-50% stake in another company, it may have the option to include its proportion of the sales on its income statements. This approach is referred to as the "proportional method." Alternatively, under the "equity method," the company does not include the sales on its income statement and instead treats it as an investment in an unconsolidated affiliate. The "cost method" is generally used when a company has a stake that is less than 20%. The ability to select a particular accounting treatment varies across countries and across industries. We thank the referee and Chuck McDonald for bringing these issues to our attention.

To insure that our results are not driven by these accounting biases, we eliminated from our sample firms where minority interest income is greater than 2% of sales and firms where investment income from unconsolidated affiliates is greater than 2% of sales. After eliminating these firms, the link between per-capita GNP and excess value is somewhat stronger and statistically more significant. Moreover, there still remains a strong link between the legal system dummies and excess value, although the dummy corresponding to the French legal system is marginally significant and the Scandinavian legal system dummy is no longer significant.

Ownership and the Value of Corporate Diversification

The results discussed in Section V suggest that corporate diversification is less costly/more beneficial for firms that are headquartered in countries where capital markets are less developed. A potential problem with this conclusion is that, so far, we have not explicitly controlled for agency costs associated with ownership concentration. Indeed, several studies suggest that firm value is correlated with ownership structure [e.g., Demsetz and Lehn (1985), Morck, Shleifer and Vishny (1988), Holderness and Sheehan (1988), and McConnell and Servaes (1990)] and that ownership structure varies across countries and legal systems [e.g., La Porta, Lopez-de-Silanes and Shleifer (1997, 1998), LaPorta, Lopez-De-Silanes and Shleifer (1999), and Claessens, Djankov, Fan and Lang (1998)]. To the extent that ownership concentration affects firm value, it may also affect the estimated value of corporate diversification. This concern may be particularly relevant if there is a strong link between ownership concentration and firm value and if focused and diversified firms have significantly different levels of ownership concentration.

The exact link between ownership structure and firm value, however, is not entirely clear. On one hand, it is widely acknowledged that concentrated ownership is likely to reduce the conflicts that arise when there is a separation between managers and stockholders. This link suggests a positive relation between firm value and ownership concentration. On the other hand, concentrated ownership provides large investors with opportunities to exploit minority

shareholders, thereby suggesting at least for some range of values a negative relation between firm value and ownership concentration. In a recent study, Holderness and Sheehan (1998) conclude that in the United States, legal constraints often effectively limit the actions of majority shareholders – but it is not clear to what extent their conclusions extend outside the U.S. Indeed, La Porta, Lopez-de-Silanes and Shleifer (1999) suggest that the costs of concentrated ownership may be particularly meaningful in less developed countries where the legal protection provided to minority shareholders is often quite limited.

An additional concern is that even if ownership concentration levels are similar for both focused and diversified firms, ownership concentration may still be important if it has a differential effect on the value of focused and diversified firms. This concern is particularly relevant if the costs associated with ownership concentration are lower for diversified firms in less developed capital markets. If this scenario is correct, it raises the possibility that cross-country variations in the value of corporate diversification can be explained by differences in capital market development as well as by differences in ownership structure. For example, smaller diversification discounts (or premiums) in less developed countries may be due to the fact that diversification is more beneficial in these markets because capital markets are less developed, enhancing the value of internal capital markets. Alternatively, smaller diversification discounts (or premiums) in less developed countries may reflect the fact that ownership concentration is generally higher in these countries, resulting in potentially lower agency costs associated with corporate diversification. Clearly, these two interpretations are not necessarily mutually exclusive, but they do again suggest the need to control for ownership concentration when calculating the value of corporate diversification.

Ownership Data

Worldscope provides firm level ownership data that consists of reported cases where an individual or institution holds at least five percent of a company's common stock. Summing up these reported holdings across all shareholders, we obtain a measure of ownership concentration

for each firm.[34] While ownership data are available for a subset of firms in our sample, an important concern arises when using this data. In many cases, there is no clear distinction between firms where no individual or institution holds a five percent stake and firms that choose not to report any ownership data. This reporting bias also appears to be systematic – in that ownership data is reported much less regularly among firms headquartered in less developed countries.[35] To insure that this reporting bias does not affect the qualitative nature of our results, we use two different methods to classify the unreported ownership data. In the first method, we treat the unreported observations as missing values. Since many of these missing observations are likely to be for firms without significant ownership concentration, this approach creates an upward bias in the level of ownership concentration. In the second method, we assign a zero value to the unreported observations. Using this method, the reported levels of ownership concentration are downward biased.

The descriptive statistics on ownership concentration are summarized in Table 2-7. The results in Panel A treat the unreported observations as missing values, while the results in Panel B treat the unreported observations as zero values. It follows that the average ownership concentration levels reported in Panel B are systematically lower than those reported in Panel A.

Three major conclusions emerge from Table 2-7. First, there does appear to be an ownership reporting bias in the Worldscope data. For example, in the low-income countries, concentrated ownership is reported for only 14% of the firms, whereas this number is 65% for the

[34] In addition to total ownership concentration, Lins and Servaes (1998) also separate ownership holdings into various detailed ownership categories and find their reported conclusions to be largely similar across the various measures of ownership concentration.

[35] Another potentially important problem with the reported ownership data is that in some countries, cross-ownership holdings and ownership pyramids are fairly common. La Porta, Lopez-de-Silanes and Shleifer (1999) study ownership concentration structures in considerable detail and estimate the magnitude of cross-holdings for the twenty largest publicly traded firms in various countries. As they point out, "the data on corporate ownership are often difficult to assemble." Since following their approach for all of the firms in our sample is prohibitive, we are forced to rely on the numbers reported by Worldscope. In this regard, we follow the approach used by Lins and Servaes (1998) and Claessens, Djankov, Fan and Lang (1998). However, it is important to note that Worldscope provides only limited ownership data for several countries in our sample.

firms in the high-income countries and 78% for the firms in the upper-middle income countries. Second, consistent with previous papers, we do find that average ownership concentration does vary across countries and legal systems. Generally, we find ownership concentration is higher in less developed markets and in markets where the legal system tends to provide less protection to investors.[36] Third, we find that while ownership concentration varies across regions and legal systems, within each region and legal system, unconditional ownership concentration levels are similar for diversified and focused firms.[37] This result tends to suggest that our earlier results on the effects of capital market development on the value of corporate diversification are not driven solely by differences in ownership concentration. Nevertheless, in order to more clearly disentangle the corresponding sources of any diversification discounts or premiums, we need to control for ownership concentration in our regression analysis.

Regression Results Controlling for Ownership Concentration

Similar to Morck, Shleifer and Vishny (1988) and others, we also account for the nonlinear relation between ownership structure and firm value by creating three separate ownership concentration variables:[38]

OWN0to10 = *total ownership* if total ownership < 0.10,

= *0.10* if total ownership ≥ 0.10;

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[36] Putting these two conclusions together also leads us to suspect that among the 35% of firms in the high income category where ownership data is not reported, a relatively high percentage of these firms may truly have disparate ownership and that ownership data is truly missing for only a small subset of these firms. Alternatively, when we consider the 86% of low income firms with no reported ownership data, we would suspect that a higher percentage of these observations are truly missing.

[37] Statistical tests for differences in the average level of ownership concentration between the focused and diversified firms are not statistically significant from zero for any of the groups.

[38] Morck, Shleifer and Vishny (MSV, 1988) use 5 percent and 25 percent as their breakpoints. Given that the Worldscope databank does not generally provide firm level ownership concentration values below 5 percent (aside from the unreported values), we use a 10 percent cut-off for the first breakpoint and 30 percent as the next breakpoint to be consistent with MSV's ownership ranges. As additional robustness checks, we also tried other breakpoints and used ownership concentration dummy variables for each of the breakpoints in place of the MSV variables. In both cases, we found that the reported conclusions were qualitatively unchanged.

OWN10to30 $= 0$ if total ownership < 0.10,

$=$ *total ownership minus 0.10* if $0.10 \leq$ total ownership < 0.30,

$= 0.20$ if total ownership ≥ 0.30;

OWNover30 $= 0$ if total ownership < 0.30,

$=$ *total ownership minus 0.30* if total ownership ≥ 0.30.

This classification suggests that the marginal impact of increased ownership concentration varies depending on whether ownership concentration is less than 10 percent, between 10 and 30 percent, and greater than 30 percent. We also interact OWN10to30 and OWNover30 with the dummy variable SEG, which equals one if the firm has multiple segments, to assess the impact of ownership concentration on the value of corporate diversification.[39] Generally, we would expect a positive link between firm value and OWN0to10. Within this range, increases in ownership concentration are likely to improve managerial incentives without dramatically increasing the risks of managerial entrenchment and expropriation. For ownership concentration levels beyond ten percent, the expected results are less clear. For these firms, the benefits of increased ownership may be more than offset by the costs resulting from increased managerial entrenchment and by the potential for the expropriation of minority shareholders. Consequently, the link between OWN10to30 and OWNover30 and firm value is less clear.

The firm level regression estimates that control for ownership concentration are reported in Table 2-8. The first three columns [(1) - (3)] contain the results where the unreported observations for ownership concentration are treated as missing. In the last three columns [(4) - (6)], these observations are treated as zeros. The most striking conclusion that emerges from the results in Table 2-8 is that even after controlling for ownership concentration, there is still a strong link between the value of corporate diversification and both the legal system dummies and per-capita GNP. Moreover, the sign and magnitudes of the estimated coefficients are quite similar to those reported earlier in Tables 2-5 and 2-6.

[39] Note that due to singularity, we do not include OWN0to10*SEG in our specification.

While it is not the primary focus of our analysis, the estimated coefficients for the ownership concentration are still of considerable interest. The estimated coefficients vary somewhat depending on the treatment of the unreported ownership observations. Nevertheless, a few basic conclusions emerge. First, for low levels of ownership concentration, there is a positive link between ownership concentration and excess value, although this link is significant only for the cases where we treat the unreported ownership observations as zeros. Second, for ownership concentration levels beyond ten percent, we generally find that increases in ownership concentration lead to a reduction in value for both focused and diversified firms. This result confirms the fact that there are both costs and benefits associated with increased ownership concentration.

Finally, in columns (5) and (6), we see from the coefficients on the ownership concentration variables that are interacted with the diversification dummy (OWN10to30*SEG and OWNover30*SEG), that the effects of ownership concentration are significantly different for focused and diversified firms. For ownership concentration levels between 10 and 30 percent, excess value is significantly lower for the diversified firms, suggesting that entrenchment problems and expropriation of minority shareholders is more of a concern for diversified firms. However, beyond 30 percent, excess value is significantly higher for diversified firms. It is notable, however, that these results do not hold up in columns (2) and (3), where the unreported ownership observations are treated as zeros.

All in all, the results suggest that there is a link between ownership concentration and excess value, and that this link may be somewhat different for focused and diversified firms. However, the exact nature of these links depends critically on the specification and on the treatment of the unreported ownership observations. It is also important to reiterate that regardless of the specification, there is strong evidence that the value of corporate diversification varies depending on the legal system and the level of capital market development.

Conclusion

Using a large database of more than 8,000 companies from 35 countries, we analyze the link between capital market development and the value of corporate diversification. We find evidence that the value of corporate diversification is negatively related to the level of capital market development. Among high-income countries where capital markets are well developed, we find that diversified firms trade at a significant discount relative to focused firms. This evidence is consistent with previous studies (Lang and Stulz (1994) and Berger and Ofek (1995)) that have documented a diversification discount for U.S. firms. In contrast, we find that there is either no diversification discount, or in some cases, a significant diversification *premium*, in countries whose capital markets are less developed. Consistent with the recent findings of LaPorta, Lopez-De-Silanes, Shleifer, and Vishny (1997, 1998), we also find that the value of diversification depends in an important way on the legal system of the country in which the firm is established.

Overall, our results suggest that the financial, legal, and regulatory environment all have an important influence on the value of diversification, and that the optimal organizational structure for firms operating in emerging markets may be very different than that for firms operating in more developed countries. In this regard, our results provide support for the arguments made by Khanna and Palepu (1997), who find that diversified industry groups in India often outperform their stand-alone counterparts. Our results are also consistent with Lins and Servaes (1999) who find that diversified firms in Japan and the United Kingdom (countries that are considered to be developed) generally trade at discounts relative to focused firms.

While we have argued that cross-country variations in the value of diversification vary with the level of capital market development, our results can be interpreted more broadly. In addition to providing better access to capital markets, or limiting the need to access these markets, diversification may provide other important benefits – particularly in countries where the economic and legal system are less developed. If the economic and legal environments make

it more difficult to contract with other firms, it may be more beneficial to merge related enterprises within the same organization than it is to have them operate on a separate, stand-alone basis. Diversified firms in these countries may also be better able to attract quality employees and better able to lobby or influence the political and regulatory process. Ultimately, each of these explanations may be applicable.

Finally, while we do not address this issue directly, our results indirectly suggest that global capital markets are not perfectly integrated. Firms in countries that have less developed capital markets appear to face a higher cost of external capital. One way to mitigate these higher costs is to adjust the optimal organizational structure. More specifically, for these firms, the establishment of an internal capital market within a diversified firm may more than offset the costs of corporate diversification. Clearly, however, there may be other ways to address these distortions. For example, Lins and Servaes (1999) stress the importance of concentrated ownership. Other alternatives may include the establishment of private banking relationships and/or the establishment of the type of interconnected business groups described by Khanna and Palepu (1997). These issues await future research.

Table 2-1
Economic Development and Legal System Measures by Country: 1991 – 1995

Country	Average Per-Capita GNP (US $)	World Bank Market Classification	Legal System Classification
Australia	17,808	High Income	English Origin
Austria	23,666	High Income	German Origin
Brazil	3,134	Upper-Middle Income	French Origin
Canada	20,098	High Income	English Origin
Chile	3,206	Upper-Middle Income[a]	French Origin
China	498	Low Income	Other
Denmark	26,936	High Income	Scandinavian Origin
Finland	21,090	High Income	Scandinavian Origin
France	22,808	High Income	French Origin
Germany	24,188	High Income	German Origin
Hong Kong	18,588	High Income	English Origin
India	316	Low Income	English Origin
Indonesia	792	Lower-Middle Income[a]	French Origin
Ireland	13,070	High Income	English Origin
Italy	19,500	High Income	French Origin
Japan	32,232	High Income	German Origin
South Korea	7,830	Upper-Middle Income	German Origin
Malaysia	3,180	Upper-Middle Income[a]	English Origin
Mexico	3,530	Upper-Middle Income	French Origin
Netherlands	21,322	High Income	French Origin
New Zealand	13,030	High Income	English Origin
Norway	26,812	High Income	Scandinavian Origin
Pakistan	432	Low Income	English Origin
Philippines	878	Lower-Middle Income	French Origin
Portugal	8,350	High Income[a]	French Origin
Singapore	20,266	High Income	English Origin
South Africa	2,890	Upper-Middle Income[a]	English Origin
Spain	13,430	High Income	French Origin
Sweden	24,960	High Income	Scandinavian Origin
Switzerland	36,800	High Income	German Origin
Taiwan	10,874	High Income	German Origin
Thailand	2,110	Lower-Middle Income	English Origin
Turkey	2,404	Lower-Middle Income[a]	French Origin
United Kingdom	17,974	High Income	English Origin
United States	24,758	High Income	English Origin

Average per-capita GNP (US $) is the five year arithmetic average of per-capita GNP from 1991–1995. The World Bank income classifications are obtained from the *World Tables*. The legal system classification identifies the legal origin of the Company Law or Commercial Code of each country. The legal system classifications are obtained from La Porta, Lopez-de-Silanes, Shleifer, and Vishny (1997).

[a] The World Bank income classifications varied across years for the following countries: Chile (lower-middle income in 1991), Indonesia (low income in 1991), Malaysia (lower-middle income in 1991), Portugal (upper-middle income in 1991 and 1992), South Africa (lower-middle income in 1991), Turkey (upper-middle income in 1993).

Table 2-2
Firm Level Summary Statistics by Development Classifications and Legal System for Single-Segment and Multi-Segment Firms: 1991 – 1995

Panel A: Firm Level Characteristics by World Bank Market Classifications

Firm Level Characteristics by Development Classifications	Single-Segment Firms		Multi-Segment Firms		Statistical Differences (p-values)	
	Median	Mean	Median	Mean	Median	Mean
High Income						
Number of Assets	1.000	1.000	2.000	2.554	0.000	0.000
Total Assets (mil $)	276	1755	641	1906	0.000	0.015
Total Capital (mil $)	180	1727	380	1844	0.000	0.126
Leverage Ratio	0.265	0.326	0.287	0.374	0.714	0.633
Operating Income/Sales	0.117	0.134	0.104	0.115	0.608	0.527
Capital Expenditure/Sales	0.049	0.111	0.046	0.078	0.872	0.389
Market/Sales	1.042	1.738	0.844	1.211	0.073	0.054
Observations	17,366	17,366	8,159	8,159		
Upper-Middle Income						
Number of Segments	1.000	1.000	3.000	2.958	0.000	0.000
Total Assets (mil $)	435	1620	931	2513	0.000	0.000
Total Capital (mil $)	460	1453	664	1776	0.047	0.000
Leverage Ratio	0.149	0.217	0.180	0.225	0.526	0.782
Operating Income/Sales	0.148	0.167	0.145	0.166	0.813	0.938
Capital Expenditure/Sales	0.083	0.172	0.090	0.167	0.726	0.739
Market/Sales	1.385	2.348	1.575	1.732	0.107	0.061
Observations	1,209	1,209	336	336		

Panel A--continued

Firm Level Characteristics by Development Classifications	Single-Segment Firms		Multi-Segment Firms		Statistical Differences (p-values)	
	Median	Mean	Median	Mean	Median	Mean
Lower-Middle Income						
Number of Segments	1.000	1.000	3.000	2.684	0.000	0.000
Total Assets (mil $)	329	1769	610	2571	0.013	0.000
Total Capital (mil $)	209	1571	412	1531	0.000	0.562
Leverage Ratio	0.174	0.268	0.199	0.231	0.732	0.824
Operating Income/Sales	0.185	0.195	0.190	0.205	0.824	0.879
Capital Expenditure/Sales	0.101	0.227	0.067	0.255	0.213	0.307
Market/Sales	1.595	2.459	1.295	2.371	0.114	0.331
Observations	937	937	79	79		
Low Income						
Number of Segments	1.000	1.000	3.000	2.833	0.000	0.000
Total Assets (mil $)	284	1452	838	2480	0.000	0.000
Total Capital (mil $)	174	1101	545	1659	0.000	0.000
Leverage Ratio	0.352	0.388	0.425	0.393	0.431	0.917
Operating Income/Sales	0.149	0.172	0.127	0.142	0.267	0.169
Capital Expenditure/Sales	0.075	0.168	0.084	0.188	0.698	0.544
Market/Sales	1.402	1.948	1.414	1.711	0.329	0.122
Observations	710	710	90	90		

Panel B: Firm Level Characteristics by Legal Systems

Firm Level Characteristics by Legal Systems	Single-Segment Firms		Multi-Segment Firms		Statistical Differences (p-values)	
	Median	Mean	Median	Mean	Median	Mean
English Origin						
Number of Assets	1.000	1.000	2.000	2.554	0.000	0.000
Total Assets (mil $)	276	1755	641	1906	0.000	0.015
Total Capital (mil $)	180	1727	380	1844	0.000	0.126
Leverage Ratio	0.265	0.326	0.287	0.374	0.714	0.633
Operating Income/Sales	0.117	0.134	0.104	0.115	0.608	0.527
Capital Expenditure/Sales	0.049	0.111	0.046	0.078	0.872	0.389
Market/Sales	1.042	1.738	0.844	1.211	0.073	0.054
Observations	17,366	17,366	8,159	8,159		
French Origin						
Number of Segments	1.000	1.000	3.000	2.958	0.000	0.000
Total Assets (mil $)	435	1620	931	2513	0.000	0.000
Total Capital (mil $)	460	1453	664	1776	0.047	0.000
Leverage Ratio	0.149	0.217	0.180	0.225	0.526	0.782
Operating Income/Sales	0.148	0.167	0.145	0.166	0.813	0.938
Capital Expenditure/Sales	0.083	0.172	0.090	0.167	0.726	0.739
Market/Sales	1.385	2.348	1.575	1.732	0.107	0.061
Observations	1,209	1,209	336	336		

Panel B--continued

Firm Level Characteristics by Legal Systems	Single-Segment Firms		Multi-Segment Firms		Statistical Differences (p-values)	
	Median	Mean	Median	Mean	Median	Mean
German Origin						
Number of Segments	1.000	1.000	3.000	2.684	0.000	0.000
Total Assets (mil $)	329	1769	610	2571	0.013	0.000
Total Capital (mil $)	209	1571	412	1531	0.000	0.562
Leverage Ratio	0.174	0.268	0.199	0.231	0.732	0.824
Operating Income/Sales	0.185	0.195	0.190	0.205	0.824	0.879
Capital Expenditure/Sales	0.101	0.227	0.067	0.255	0.213	0.307
Market/Sales	1.595	2.459	1.295	2.371	0.114	0.331
Observations	937	937	79	79		
Scandinavian Origin						
Number of Segments	1.000	1.000	3.000	2.833	0.000	0.000
Total Assets (mil $)	284	1452	838	2480	0.000	0.000
Total Capital (mil $)	174	1101	545	1659	0.000	0.000
Leverage Ratio	0.352	0.388	0.425	0.393	0.431	0.917
Operating Income/Sales	0.149	0.172	0.127	0.142	0.267	0.169
Capital Expenditure/Sales	0.075	0.168	0.084	0.188	0.698	0.544
Market/Sales	1.402	1.948	1.414	1.711	0.329	0.122
Observations	710	710	90	90		

In Panel A, firms are classified each year by their country's World Bank market classification, while in Panel B firms are classified by their country's legal system. Single-segment firms are firms that operate in only one two-digit SIC code industry. Multi-segment firms are defined as firms that operate in two or more two-digit SIC code industries and no firm segment sales exceed 90% of total firm sales. The leverage ratio is defined as book value of debt divided by total assets. Market-to-sales is defined as the ratio of a firm's market value of equity plus book value of debt to its total sales.

Table 2-3
Excess Values by Development Groups, Broader Per-Capita GNP Groups and Legal Systems for Single-Segment and Multi-Segment Firms: 1991 - 1995

Panel A: Excess Values by World Bank Market Classification for Single-Segment and Multi-Segment Firms

Firm Level Characteristics by Development Classification	Single-Segment Firms		Multi-Segment Firms		Statistical Differences (p-values)	
	Median	Mean	Median	Mean	Median	Mean
High Income	0.0000	0.0199	-0.0576	-0.0584	0.000	0.000
Upper-Middle Income	0.0000	0.0070	-0.0722	-0.0181	0.051	0.398
Lower-Middle Income	0.0000	0.0330	0.0863	0.0543	0.032	0.721
Low Income	0.0000	0.0100	0.0380	0.0945	0.161	0.005
Observations						
High Income	17,366	17,366	8,159	8,159		
Upper-Middle Income	1,209	1,209	336	336		
Lower-Middle Income	937	937	79	79		
Low Income	710	710	90	90		

Panel B: Excess Values by Per-Capita GNP for Single-Segment and Multi-Segment Firms

Excess Values by Per-Capita GNP	Single-Segment Firms		Multi-Segment Firms		Statistical Differences (p-values)	
	Median	Mean	Median	Mean	Median	Mean
Per-Capita GNP ≥ $15,000	0.0000	0.0211	-0.0578	-0.0579	0.000	0.000
$15,000 > Per-Capita GNP > $5,000	0.0000	-0.0026	-0.0542	-0.0281	0.136	0.488
Lo$5,000 ≥ Per-Capita GNP > $1,000	0.0000	0.0260	-0.0400	-0.0264	0.148	0.112
$1,000 ≥ Per-Capita GNP	0.0000	0.0068	0.0541	0.0841	0.101	0.014
Observations						
Per-Capita GNP ≥ $15,000	16,543	16,543	8,072	8,072		
$15,000 > Per-Capita GNP > $5,000	1,069	1,069	164	164		
Lo$5,000 ≥ Per-Capita GNP > $1,000	1,643	1,643	306	306		
$1,000 ≥ Per-Capita GNP	967	967	122	122		

Panel C: Excess Values by Legal Systems for Single-Segment and Multi-Segment Firms

Excess Values by Legal Systems	Single-Segment Firms		Multi-Segment Firms		Statistical Differences (p-values)	
	Median	Mean	Median	Mean	Median	Mean
English Origin	0.0000	0.0088	-0.0576	-0.0584	0.000	0.000
French Origin	0.0000	0.0287	-0.0722	-0.0181	0.051	0.398
German Origin	0.0000	0.0322	0.0863	0.0543	0.032	0.721
Scandinavian Origin	0.0000	0.0050	0.0380	0.0945	0.161	0.005
Observations						
English Origin	14,931	14,931	6,207	6,207		
French Origin	2,378	2,378	843	843		
German Origin	2,108	2,108	1,290	1,290		
Scandinavian Origin	683	683	368	368		

In Panel A, firms are classified each year by their country's World Bank market classification, while in Panel B firms are classified by broader per-capita GNP groups. In Panel C, firms are classified by their country's legal system. Excess value is defined as the natural logarithm of the ratio of a firm's market-to-sales ratio to its imputed market-to-sales ratio. Firms with excess values that are greater than four or less than one-fourth are eliminated from the sample. Single-segment firms are firms that operate in only one two-digit SIC code industry. Multi-segment firms are defined as firms that operate in two or more two-digit SIC code industries and no firm segment sales exceed 90% of total firm sales.

Table 2-4
Country Level Regression Estimates of Excess Values: 1991 – 1995

Country	Constant	SEG	OIS	CES	ASSETS	Adj R^2	Obs
Australia	-0.520*	-0.152***	0.192*	0.328***	0.022	0.059	596
	(-1.810)	(-3.021)	(1.859)	(4.236)	(1.464)		
Austria	0.666	-0.211**	0.661**	0.074	-0.035	0.058	129
	(0.942)	(-1.970)	(2.163)	(0.252)	(-1.063)		
Brazil	-1.447***	-0.075	0.141	-0.031	0.124***	0.080	245
	(-4.417)	(-0.700)	(0.730)	(-1.511)	(4.601)		
Canada	-1.468***	-0.059*	0.027	0.192***	0.073***	0.062	1,315
	(-7.616)	(-1.665)	(0.430)	(5.701)	(7.413)		
Chile	-1.128*	-0.289	-0.016	0.048***	0.053**	0.091	118
	(-1.830)	(-1.300)	(-0.534)	(2.533)	(2.225)		
China	0.392	0.221	0.065	0.275	-0.019	0.000	78
	(0.307)	(0.447)	(0.158)	(1.366)	(-0.323)		
Denmark	-0.165	-0.063	2.016***	0.619***	-0.003	0.137	270
	(-0.398)	(-0.937)	(5.432)	(3.925)	(-0.163)		
Finland	-0.356	-0.016	0.881***	0.448**	0.012	0.075	209
	(-1.291)	(-0.282)	(2.939)	(2.119)	(0.828)		
France	-0.953***	-0.085***	-0.004	0.052	0.052***	0.038	1,131
	(-4.924)	(-2.502)	(-0.539)	(1.378)	(5.821)		
Germany	0.212	-0.050	0.807***	0.223***	-0.009	0.039	1,296
	(1.270)	(-1.568)	(7.054)	(3.370)	(-1.094)		
Hong Kong	-0.235	0.145***	0.214	0.065	0.005	0.021	374
	(-0.574)	(2.786)	(1.176)	(0.838)	(0.271)		
India	-1.940***	-0.011	2.184***	0.260***	0.080***	0.235	553
	(-5.355)	(-0.175)	(9.863)	(3.491)	(5.335)		
Indonesia	-1.927***	-0.104	0.400	0.236***	0.082***	0.117	218
	(-2.715)	(-1.011)	(1.381)	(2.892)	(2.896)		
Ireland	-1.646***	-0.003	0.377***	0.074***	0.084***	0.116	179
	(-4.148)	(-0.037)	(2.543)	(2.585)	(3.858)		
Italy	1.101*	0.073	0.322	0.293	-0.041*	0.015	259
	(1.917)	(1.099)	(0.948)	(0.978)	(-1.935)		
Japan	2.658***	-0.039*	2.908***	-0.697***	-0.108***	0.237	1,137
	(11.772)	(-1.635)	(12.204)	(-2.760)	(-12.588)		
Malaysia	0.864**	0.063	1.172***	0.121*	-0.046***	0.103	527
	(2.484)	(1.274)	(6.343)	(1.690)	(-2.583)		
Mexico	-0.342	-0.102	0.168	0.412	0.007	0.021	108
	(-0.439)	(-1.029)	(0.530)	(1.289)	(0.201)		

Table 2-4--continued

Country	Constant	SEG	OIS	CES	ASSETS	Adj R^2	Obs
Netherlands	-0.787***	-0.040	1.406***	-0.165	0.039***	0.067	388
	(-2.819)	(-0.798)	(4.446)	(-0.668)	(2.839)		
New Zealand	0.773	-0.214*	0.756**	-0.584	-0.446	0.035	101
	(1.408)	(-1.942)	(2.511)	(-0.549)	(-1.579)		
Norway	0.377	0.172**	0.544***	0.347***	-0.023	0.137	235
	(0.757)	(2.145)	(2.793)	(4.889)	(-0.945)		
Pakistan	-0.269	0.606***	0.868***	0.021	0.013	0.153	134
	(-0.380)	(3.188)	(2.694)	(0.083)	(0.406)		
Philippines	-0.478	0.430	0.064	0.116	0.021	0.000	97
	(-0.598)	(1.297)	(0.430)	(1.068)	(0.556)		
Portugal	-1.205	0.031	0.774*	0.353	0.044	0.013	84
	(-1.166)	(0.094)	(1.902)	(0.886)	(1.057)		
Singapore	-0.323	0.132***	0.561***	0.110	0.004	0.064	368
	(-0.906)	(2.570)	(2.987)	(1.019)	(0.224)		
South Korea	1.349**	0.066	0.324	0.643***	-0.052**	0.053	264
	(2.011)	(1.057)	(1.000)	(3.613)	(-2.052)		
South Africa	0.178	-0.072	1.860***	0.411***	-0.030	0.184	305
	(0.423)	(-1.032)	(7.221)	(4.710)	(-1.452)		
Spain	-0.393	-0.307***	0.327**	0.104	0.013	0.043	320
	(-0.800)	(-3.206)	(2.171)	(0.654)	(0.620)		
Sweden	-0.963***	-0.174***	1.327***	-0.174	0.048***	0.111	337
	(-2.784)	(-3.066)	(3.509)	(-1.040)	(3.093)		
Switzerland	-1.067***	0.016	1.180***	0.239	0.048***	0.107	358
	(-3.104)	(0.313)	(4.623)	(1.144)	(2.881)		
Taiwan	0.697	0.170	0.743***	0.096	-0.032	0.064	214
	(1.104)	(1.239)	(3.521)	(0.566)	(-1.208)		
Thailand	-0.325	-0.094	0.069	0.126**	0.021	0.022	460
	(-0.774)	(-0.659)	(1.245)	(2.506)	(1.055)		
Turkey	-1.114	-0.688*	-0.201	1.520***	0.033	0.247	67
	(-0.901)	(-1.653)	(-0.531)	(4.037)	(0.772)		
United Kingdom	-0.572***	-0.067***	0.251***	0.575***	0.029***	0.056	4,951
	(-6.744)	(-3.734)	(6.470)	(10.742)	(6.221)		
United States	-0.250***	-0.132***	0.393***	0.596***	0.008**	0.059	11,461
	(-3.827)	(-10.548)	(13.216)	(15.383)	(2.475)		

Significant at 1 percent (***), 5 percent (**), and 10 percent (*) levels.

We estimate the following regression model from 1991-1995 for each of the thirty-five individual countries in our sample:

Excess Value = $\alpha + \beta_1$ (Diversification Dummy) + β_2 (Log Assets) + β_3 (Operating Income / Sales) + β_4 (Capital Expenditures / Sales) + e.

Excess value is defined as the natural logarithm of the ratio of a firm's market-to-sales ratio to its imputed market-to-sales ratio. Firms with excess values that are greater than four or less than one-fourth are eliminated from the sample. The diversification dummy, SEG, is equal to one for multi-segment firms and zero otherwise. Multi-segment firms are defined as firms that operate in two or more two-digit SIC code industries and no firm segment sales exceed 90% of total firm sales. OIS is defined as the firm's operating income-to-sales, while CES is the firm's capital

expenditures-to-sales. Assets are defined as the natural logarithm of the firm's total assets. The regressions also include year dummies for 1992-1995.

Table 2-5
Firm Level Regression Estimates of Excess Values: 1991 – 1995

Variables	OLS (1)	OLS (2)	OLS (3)	Fixed Effects (4)
Constant	-0.270*** (-10.677)	-0.232*** (-8.726)	-0.240*** (-9.040)	____
Multi-Segment Dummy (SEG)	-0.078*** (-10.748)	-0.096*** (-11.584)	-0.004 (-0.201)	0.037 (1.048)
Operating Income-to-Sales (OIS)	0.042*** (6.540)	0.043*** (6.702)	0.043*** (6.701)	-0.006 (-0.372)
Capital Expenditures-to-Sales (CES)	0.226*** (18.982)	0.226*** (18.982)	0.225*** (18.898)	0.144*** (11.733)
Log of Total Assets (ASSETS)	0.014*** (11.424)	0.012*** (9.343)	0.012*** (9.565)	-0.027*** (-5.571)
Per-Capita GNP (GNPCAP*SEG)[a]	____	____	-0.426*** (-4.252)	-0.682*** (-4.423)
Low Income Dummy (G1*SEG)	____	0.142** (2.398)	____	____
Lower-Middle Income Dummy (G2*SEG)	____	0.036 (0.564)	____	____
Upper-Middle Income Dummy (G3*SEG)	____	0.002 (0.063)	____	____
French Legal System Dummy (FRENCH*SEG)	____	0.052*** (2.509)	0.047** (2.268)	-0.033 (-0.703)
German Legal System Dummy (GERMAN*SEG)	____	0.072*** (4.030)	0.099*** (5.170)	0.111*** (2.763)
Scandinavian Legal System Dummy (SCAND*SEG)	____	0.044 (1.449)	0.058* (1.919)	0.013 (0.226)
Adjusted R^2	0.025	0.025	0.026	0.027
Number of Observations	28,886	28,886	28,886	28,886

Significant at 1 percent (***), 5 percent (**), and 10 percent (*) levels.
[a] coefficient estimate x 10^{-5}

Regression estimates are from 1991-1995. Excess value is defined as the natural logarithm of the ratio of a firm's market-to-sales ratio to its imputed market-to-sales ratio. Firms with excess values that are greater than four or less than one-fourth are eliminated from the sample. The diversification dummy, SEG, is equal to one for multi-segment firms and zero otherwise. Multi-segment firms are defined as firms that operate in two or more two-digit SIC code industries and no firm segment sales exceed 90% of total firm sales. SEGN is the number of firm segments defined at the two-digit SIC code level. GNPCAP is the annual per-capita GNP of the country where the firm is headquartered. G1-G3 are dummy variables corresponding to each of the

World Bank income groups. French, German, and Scandinavian are dummy variables corresponding to each legal system. The dummy variables are equal to one for each corresponding classification and zero otherwise. Per-capita GNP, the World Bank income group dummies, and the legal system dummies are interacted with the multi-segment dummy (SEG) for the all firms panel and the number of segments (SEGN) for the multi-segment firms panel. Models 1-3 are estimated over 1991-1995 using ordinary least squares. Column (4) provides fixed-effects estimates (within-firm estimates) of Model 3. Each model specification also includes year dummies for 1992-1995.

Table 2-6
Firm Level Regression Estimates of Excess Values using Additional Proxies for Capital Market Development and the Legal Environment: 1991 - 1995

Variables	OLS (1)	Fixed Effects (2)	OLS (3)	Fixed Effects (4)
Constant	-0.237*** (-8.665)	———	-0.226*** (-8.435)	———
Multi-Segment Dummy (SEG)	-0.164** (-1.942)	-0.156 (-1.404)	-0.063** (-2.099)	-0.103* (-1.725)
Operating Income-to-Sales (OIS)	0.042*** (6.636)	0.011* (1.688)	0.042*** (6.645)	0.010* (1.657)
Capital Expenditures-to-Sales (CES)	0.223*** (18.769)	0.260*** (11.673)	0.224*** (18.804)	0.260*** (11.664)
Log of Total Assets (ASSETS)	0.012*** (9.279)	0.007*** (3.136)	0.012*** (9.086)	0.007*** (3.234)
Per-Capita GNP (GNPCAP*SEG)[a]	-0.420** (-2.131)	-0.467** (-2.099)	———	———
[(MKTCAP + Debt)/GNP]*SEG	-0.054** (-1.976)	-0.069* (-1.684)	-0.054** (-2.352)	-0.056** (-2.031)
(Domestic Firms/Pop)*SEG	-0.002*** (-3.150)	-0.002** (-2.404)	-0.002*** (-2.743)	-0.003** (-1.983)
(IPOs/Pop)*SEG	0.013 (1.083)	0.005 (0.639)	0.016 (1.345)	0.003 (0.537)
French Legal System Dummy (FRENCH*SEG)	0.066*** (4.779)	0.035** (2.341)	0.058*** (4.574)	0.040** (2.185)
German Legal System Dummy (GERMAN*SEG)	0.082*** (5.284)	0.042** (2.347)	0.061*** (4.893)	0.059*** (2.991)
Scandinavian Legal System Dummy (SCAND*SEG)	0.034*** (3.679)	0.041** (2.254)	0.033*** (3.633)	0.031** (2.010)
(Rule of Law)*SEG	-0.005 (-0.464)	-0.024 (-1.422)	-0.025*** (-4.017)	-0.016** (-2.322)
Adjusted R^2	0.027	0.040	0.026	0.038
Number of Observations	27,132	27,132	27,132	27,132

Significant at 1 percent (***), 5 percent (**), and 10 percent (*) levels.
[a] coefficient estimate x 10^{-5}

Regression estimates are from 1991-1995. Excess value is defined as the natural logarithm of the ratio of a firm's market-to-sales ratio to its imputed market-to-sales ratio. Firms with excess values that are greater than four or less than one-fourth are eliminated from the sample. The diversification dummy, SEG, is equal to one for multi-segment firms and zero otherwise. Multi-segment firms are defined as firms that operate in two or more two-digit SIC code industries and no firm segment sales exceed 90% of total firm sales. GNPCAP is the annual per-capita GNP of the country where the firm is headquartered. French, German, and Scandinavian are dummy

variables corresponding to each legal system. The dummy variables are equal to one for each corresponding classification and zero otherwise. From LaPorta, Lopez-De-Silanes, Shleifer, and Vishny (1997), we obtain for each country the ratio of the stock market capitalization held by minorities plus the sum of bank debt of the private sector and outstanding non-financial bonds to GNP (MKTCAP + Debt/GNP), the ratio of the number of domestic firms listed in a given country to its population (Domestic Firms/Pop), and the ratio of the number of the initial public offerings of equity in a given country to its population (IPOs/Pop). From LLSV, we also obtain the law and order tradition (Rule of Law) in each country. Columns 1 and 3 provide OLS estimates over 1991-1995, while columns 2 and 4 provide fixed-effects estimates (within-firm estimates). Each specification also includes year dummies for 1992-1995.

Table 2-7
Descriptive Statistics on Ownership Concentration by Economic Development and Legal System: 1991 – 1995

Panel A: Ownership Concentration for Subset of Firms Reporting Ownership Holdings Greater or Equal to 5%

Groups	Total		Single-Segment Firms	
	Mean	Median	Mean	Median
Economic Development:				
High Income	0.40	0.38	0.41	0.39
Upper-Middle Income	0.52	0.54	0.54	0.57
Lower-Middle Income	0.63	0.65	0.64	0.66
Low Income	0.59	0.60	0.58	0.60
Legal System:				
English Origin	0.39	0.36	0.40	0.38
French Origin	0.58	0.60	0.59	0.61
German Origin	0.43	0.38	0.44	0.42
Scandinavian Origin	0.44	0.44	0.45	0.46

Panel A--continued

Groups	Multi-Segment Firms		% of Total Sample Reporting Ownership
	Mean	Median	
Economic Development:			
High Income	0.38	0.34	65%
Upper-Middle Income	0.46	0.46	78%
Lower-Middle Income	0.61	0.61	34%
Low Income	0.65	0.69	14%
Legal System:			
English Origin	0.36	0.32	61%
French Origin	0.55	0.56	64%
German Origin	0.40	0.35	72%
Scandinavian Origin	0.42	0.40	73%

Panel B: Ownership Concentration Set Equal to Zero where Not Reported

Groups	Total		Single-Segment Firms		Multi-Segment Firms	
	Mean	Median	Mean	Median	Mean	Median
Economic Development:						
High Income	0.32	0.29	0.33	0.31	0.30	0.26
Upper-Middle Income	0.43	0.48	0.44	0.51	0.41	0.44
Lower-Middle Income	0.22	0.00	0.21	0.00	0.41	0.00
Low Income	0.08	0.00	0.08	0.00	0.11	0.00
Legal System:						
English Origin	0.29	0.27	0.30	0.28	0.28	0.24
French Origin	0.44	0.51	0.43	0.51	0.47	0.51
German Origin	0.33	0.24	0.33	0.22	0.32	0.24
Scandinavian Origin	0.39	0.39	0.41	0.42	0.37	0.36

Worldscope provides firm level ownership data that consists of reported cases where an individual or institution holds at least five percent of a company's common stock. Summing up these reported holdings, we obtain ownership concentration. We use two different methods to classify the unreported ownership data. In the first method (Panel A), we treat the unreported observations as missing values. In the second method (Panel B), we treat the unreported observations as zero values.

Table 2-8
Firm Level Regression Estimates of Excess Values Controlling for Ownership Concentration: 1991 – 1995

Variables	Subset of Firms Reporting Ownership Concentration Greater or Equal to 5%		
	OLS (1)	OLS (2)	Fixed Effects (3)
Constant	-0.073 (-1.223)	-0.065 (-1.088)	———
Multi-Segment Dummy (SEG)	-0.041 (-1.504)	-0.085** (-2.392)	-0.084** (-2.400)
Operating Income-to-Sales (OIS)	0.350*** (16.700)	0.349*** (16.662)	0.351*** (16.718)
Capital Expenditures-to-Sales (CES)	0.213*** (13.287)	0.213*** (13.302)	0.212*** (13.309)
Log of Total Assets (ASSETS)	0.005*** (3.438)	0.006*** (3.632)	0.006*** (3.646)
Per-Capita GNP (GNPCAP*SEG)[a]	-0.378*** (-3.072)	-0.327*** (-2.619)	-0.329*** (-2.644)
French Legal System Dummy (FRENCH*SEG)	0.086*** (3.358)	0.072*** (2.747)	0.072*** (2.735)
German Legal System Dummy (GERMAN*SEG)	0.136*** (5.935)	0.128*** (5.528)	0.129*** (5.573)
Scandinavian Legal System Dummy (SCAND*SEG)	0.097** (2.712)	0.089*** (2.492)	0.088*** (2.493)
Ownership Concentration < 10 (OWN0to10)	0.079 (0.145)	0.055 (0.102)	0.051 (0.094)
Ownership Concentration 10-30 (OWN10to30)	-0.289*** (-3.387)	-0.336*** (-3.416)	-0.344*** (-3.500)
Ownership Concentration > 30 (OWNover30)	-0.054** (-1.968)	-0.077** (-2.373)	-0.068** (-2.129)
Ownership Concentration 10-30 interacted with SEG (OWN10to30*SEG)	———	0.142 (0.950)	0.155 (1.040)
Ownership Concentration > 30 interacted with SEG (OWNover30*SEG)	———	0.089 (1.468)	0.081 (1.343)
Adjusted R^2	0.040	0.041	0.042
Number of Observations	18,225	18,225	18,225

Table 2-8—continued

Variables	Ownership Concentration Set Equal to Zero where Not Reported		
	OLS (4)	OLS (5)	Fixed Effects (6)
Constant	-0.126*** (-4.078)	-0.134*** (-4.341)	———
Multi-Segment Dummy (SEG)	-0.026 (-1.137)	-0.007 (-0.258)	-0.006 (-0.249)
Operating Income-to-Sales (OIS)	0.303*** (17.138)	0.303*** (17.142)	0.304*** (17.185)
Capital Expenditures-to-Sales (CES)	0.160*** (12.224)	0.160*** (12.254)	0.161*** (12.250)
Log of Total Assets (ASSETS)	0.006*** (4.368)	0.006*** (4.450)	0.006*** (4.466)
Per-Capita GNP (GNPCAP*SEG)[a]	-0.336*** (-3.237)	-0.331*** (-3.175)	-0.331*** (-3.200)
French Legal System Dummy (FRENCH*SEG)	0.067*** (2.887)	0.063*** (2.670)	0.063*** (2.656)
German Legal System Dummy (GERMAN*SEG)	0.107*** (5.292)	0.102*** (4.999)	0.103*** (5.039)
Scandinavian Legal System Dummy (SCAND*SEG)	0.079** (2.439)	0.080*** (2.469)	0.080*** (2.468)
Ownership Concentration < 10 (OWN0to10)	0.550*** (3.915)	0.537*** (3.815)	0.533*** (3.788)
Ownership Concentration 10-30 (OWN10to30)	-0.313*** (-4.033)	-0.213*** (-2.479)	-0.219*** (-2.556)
Ownership Concentration > 30 (OWNover30)	-0.043 (-1.590)	-0.083*** (-2.613)	-0.074** (-2.364)
Ownership Concentration 10-30 interacted with SEG (OWN10to30*SEG)	———	-0.300*** (-2.689)	-0.289*** (-2.599)
Ownership Concentration > 30 interacted with SEG (OWNover30*SEG)	———	0.132** (2.248)	0.124** (2.129)
Adjusted R^2	0.035	0.035	0.036
Number of Observations	28,886	28,886	28,886

Significant at 1 percent (***), 5 percent (**), and 10 percent (*) levels. [a] coefficient estimate x 10^{-5}.

Regression estimates are from 1991-1995. Excess value is defined as the natural logarithm of the ratio of a firm's market-to-sales ratio to its imputed market-to-sales ratio. Firms with excess values that are greater than four or less than one-fourth are eliminated from the sample. The

diversification dummy, SEG, is equal to one for multi-segment firms and zero otherwise. Multi-segment firms are defined as firms that operate in two or more two-digit SIC code industries and no firm segment sales exceed 90% of total firm sales. GNPCAP is the annual per-capita GNP of the country where the firm is headquartered. French, German, and Scandinavian are dummy variables corresponding to each legal system. The dummy variables are equal to one for each corresponding classification and zero otherwise. We use two different methods to classify unreported the ownership data. In the first method (columns 1-3), we treat the unreported observations as missing values. In the second method (columns 4-6), we treat the unreported observations as zero values. OWN0to10: = *total ownership* if total ownership < 0.10, = *0.10* if total ownership ≥ 0.10; OWN10to30: = *0* if total ownership < 0.10, = *total ownership minus 0.10* if $0.10 \leq$ total ownership < 0.30, = *0.20* if total ownership ≥ 0.30; OWNover30: = *0* if total ownership < 0.30, = *total ownership minus 0.30* if total ownership ≥ 0.30. Column (3) and (6) provide fixed-effects estimates (within-firm estimates) of Model 2. Each model specification also includes year dummies for 1992-1995.

CHAPTER 3
FIRM VALUE AND INTERNATIONAL DIVERSIFICATION

Introduction

Over the past twenty-five years, foreign investment by corporations in the industrialized nations has grown dramatically. Specifically, net foreign investment by firms in OECD countries has grown from around $9 billion U.S. dollars in 1975 to $154 billion U.S. dollars in 1997 (Global Development Finance, 1999). Indeed, for many companies today, foreign investment now represents a considerable portion of their overall sales and profits.

This increase in foreign investment has occurred for a number of reasons. Most notably, lower transaction costs, improved communications, and increasingly integrated capital markets have lowered the cost of doing business in foreign markets. To the extent that firms are able to leverage their operations worldwide, international investment may enable them to capture valuable operating synergies. International diversification may also provide important financial synergies to the extent it is efficient for multinational firms to raise external capital and then allocate it among their various global operations using internal capital markets. Multinational firms also provide investors with a vehicle to diversify their investments internationally without having to directly invest in foreign markets, although it is unclear if any of this benefit accrues to the multinational itself.

At the same time, firms often incur additional costs and risks when investing in foreign markets. While geographic diversification may reduce corporate risk, multinational firms also have to contend with exchange rate risk, political risk, and the costs incurred when managing resources over a larger geographic area. So while it is widely acknowledged that companies face additional benefits and costs when investing overseas, it is unclear whether geographically

diversified firms trade at a premium or discount relative to firms that operate within a single market.

Recently, several studies have found that U.S. firms that diversify along product lines trade at a discount relative to focused firms [e.g., Lang and Stulz (1994) and Berger and Ofek (1995)]. Other studies [e.g., Lins and Servaes (1999) and Fauver, Houston, and Naranjo (1999)] have found that this result extends to other industrialized countries.[1] However, many multi-product firms are also geographically diversified. Thus, it is difficult to disentangle the effects of product market diversification and geographic diversification without simultaneously controlling for the two effects. In particular, since the level of product market diversification influences firm value, it is important to also control for the level of product market diversification when evaluating the benefits of geographic diversification.

The existing evidence regarding the corporate benefits of international diversification has so far yielded mixed and inconclusive results.[2] Bodnar, Tang, and Weintrop (1998), for example, use a large sample of U.S. firms over the time period from 1987 to 1993, and find that geographically diversified firms have higher values relative to comparable single-product domestic firms. Interestingly, they also find that the product market diversification discount becomes less pronounced after controlling for whether or not the firm is geographically diversified. Using Tobin's Q and a sample of U.S. firms, Morck and Yeung (1991, 1998) also find a positive relation with geographic diversification and a negative relation with industrial diversification. Similarly, Errunza and Senbet (1981, 1984) determine a positive relation between the degree of international involvement and excess value. On the other hand, Denis, Denis, and

[1] Fauver, Houston, and Naranjo (1999), however, find that these results do not necessarily extend to countries that have less developed capital markets.

[2] Many of the earlier studies, moreover, do not simultaneously control for the effects of product market and geographic diversification. For instance, Kim and Lyn (1986) find there exists a positive relation between the excess value of a multinational corporation and the degree of international involvement, but they do not simultaneously control for industry effects.

Yost (1999) find that geographic and industrial diversification, separately, lowers value, but that firms that diversify both industrially and geographically experience an increase in value.

In this paper, we further investigate the connection between product and geographic diversification by examining firms that are headquartered in Germany, Japan, the U.K., and the U.S.[3] We also extend earlier studies by controlling for the firm's ownership structure, since previous studies have found that a firm's ownership structure plays a significant role in affecting the value of corporate diversification (e.g., Denis, Denis, and Sarin (1997), Claessens, Djankov, Fan and Lang (1998) and Fauver, Houston, and Naranjo (1999)). Lastly, we also employ both domestic and international benchmarks in assessing the value of geographic diversification.

In our analysis, we have collected data for more than 4,000 firms located in four industrialized countries (Germany, Japan, the U.K. and U.S.) over the time period 1991-1995. Using the methodology adopted by Berger and Ofek (1995), we calculate the implied value of geographic and product diversification. Our regression analysis also controls for the firm's size, profitability, capital intensity, and ownership structure.

Our results suggest that product market diversification has a negative effect on firm value in three of the four countries (Japan, the U.K., and the U.S.). These results directly parallel the results reported by Lins and Servaes (1999) and Fauver, Houston, and Naranjo (1999), each of whom found that focused firms performed better in Japan, the U.K., and the U.S., while product market diversification had no significant effect on German firms. Moreover, after controlling for firm characteristics and the level of product market diversification, we find that multinational firms trade at a premium relative to firms that operate in a single domestic market in two of the four countries (Japan and the U.S.). These results confirm Bodnar, Tang, and Weintrop's evidence regarding U.S. firms, but they also suggest that the observed value of geographic diversification may not extend to multinationals throughout the world.

[3] Although we limit our study to these four countries, the firms within them operate in many countries throughout the world.

In one respect, these results are not surprising. When firms are ranked worldwide, Japanese and U.S. multinationals are typically among the largest and most profitable. At first glance, these results suggest that the average Japanese and U.S. multinational firm is able to generate valuable operating synergies, which leads them to be worth more than the simple sum of their individual parts.

Interestingly, however, we also employ additional tests which indicate that while multinationals may dominate firms in their own domestic markets, they do no better than a matched portfolio of international firms. These results are consistent with the findings of several studies in the international investments literature which find that the risk-adjusted returns of multinationals are similar to that of a portfolio of individual stocks that have the same characteristics as the individual parts of the multinational (e.g., Heston and Rouwenhorst (1994), Griffin and Karolyi (1998), and Rowland and Tesar (1998)).

The rest of this chapter proceeds as follows. The next section describes the data and methodology. Section three presents the unconditional results regarding the impact of product-market diversification and geographic diversification. Section four presents the regression results that control for various firm characteristics, including ownership concentration. In these regressions, firm value is calculated relative to a domestic benchmark; this enables us to test whether multinational firms outperform domestic firms that operate in the country in which they are headquartered. Section five reports similar regression results using an alternative international benchmark; this enables us to test whether multinational firms outperform an international portfolio of domestic firms. Section six describes the impact of excluding conglomerate firms from the sample, while section seven provides a conclusion.

Data and Methodology

Description of Data

Our primary data source is the Worldscope database. Worldscope has product and geographic segment data on more than 8,000 firms, covering 49 countries. The firms in this

database represent more than 85% of the world's total market capitalization. The Worldscope database disaggregates sales along two dimensions: business segments and geographic regions. The business segment data breaks down the company's sales according to product markets, and the geographic region data breaks down sales according to the country and/or region where the products are sold. The business segment data starts in 1991. The geographic region data, however, is primarily available for only the most developed markets. Given these constraints, our analysis focuses on firms in four developed countries (Germany, Japan, the U.K., and the U.S.), over the time period from 1991 to 1995.

We use a combination of business segment and geographic region data to categorize firms (in each of the four countries) into the four categories outlined below:

Single Region (GEO=0)	Multiple Region (GEO=1)	
Single Segment (SEG=0)	Domestic/Focused	Multinational/Focused
Multiple Segment (SEG=1)	Domestic/Conglomerate	Multinational/Conglomerate

Following Lins and Servaes (1999) and Fauver, Houston, and Naranjo (1999), we use two-digit SIC codes to classify firms along product lines. In order to be considered geographically diversified, the firm must have more than 10 percent of their total sales outside of their home country. Furthermore, we remove firms from the sample whose primary activity is financial services (firms with more than fifty percent of their total sales allocated to SIC codes 6000-6999) because their sales are irregularly disclosed. Finally, private companies are omitted because the computation of market capitalization requires market prices.

Description of Methodology

We estimate the value of corporate geographic diversification by modifying the techniques used by Berger and Ofek (1995). Specifically, we utilize the firm's market capital-to-sales ratio as a measure of corporate profitability. The market value of equity plus the book value of debt is used as an estimate of the total market value of the firm's capital. Berger and Ofek (1995) and Bodnar, Tang, and Weintrop (1998) use the same ratio to determine profitability, but

they also consider two other ratios: the ratio of total capital (or price)-to-earnings and the ratio of total capital-to-assets. In their analysis, the three measures yield similar results. Because of the limited reporting of segment assets and earnings for firms outside the United States, we are forced to use the total market capital-to-sales ratio as the sole measure of firm value.

All else equal, if diversification increases firm value, we would expect diversified firms to have higher market-to-sales ratios. Lamont and Polk (1999) show that higher market-to-sales ratios may arise for two reasons: (1) product and geographic diversification may produce valuable operating synergies which lead to higher cash flows and higher market values for a given level of sales; (2) diversification may reduce the firm's risk and cost of capital, in which case the higher market value stems from a lower discount rate.

Because of differences in capital intensity, growth opportunities, and other factors, we would expect the market-to-sales ratio to vary considerably among firms in different industries. Therefore, we need to control for industry effects when estimating the impact that diversification has on firm value. To control for industry effects, we calculate the excess value of each firm by taking the difference between the firm's actual performance and its imputed performance. Actual performance is measured by the consolidated firm's capital-to-sales ratio. For single-segment firms, imputed value is calculated as the median market-to-sales ratio among all pure-play (single-segment firms) within the same industry and same country. For multi-segment firms, imputed value is calculated by taking a weighted-average of the imputed values for each of the firm's segments, where the weights reflect the proportion of the overall firm's sales that come from each segment. Multi-segment firms have a positive excess value (i.e., a premium) if the overall company's value is greater than the "sum of the parts." By contrast, multi-segment firms have a negative excess value if their value is less than the imputed value that would be obtained by taking a portfolio of pure-play firms that operate in the same industries and country as the diversified firm.

We consider two approaches for estimating imputed performance. The first approach (the domestic benchmark) compares the firm's performance to firms that operate in the same industry(s) and within the country that the firm is headquartered. This benchmark, which is also employed by Bodnar, Tang, and Weintrop (1998) and Denis, Denis, and Yost (1999), indicates whether the average multinational firm trades at a premium or discount relative to the domestic firms in its home country. In effect, this approach addresses the issue of whether geographic diversification increases firm value.

The second approach (the international benchmark) also compares the firm's performance to firms that operate in the same industry(s), but here imputed performance is based on a weighted average of the imputed values for the various countries in which the firm operates. So, for example, if a computer firm has 70% of its sales in the U.S. and 30% in Canada, the imputed value, using the international benchmark would be:

(.7)(the value of the median pure-play U.S. computer firm)
+ (.3)(the value of the median pure-play Canadian computer firm).

Once again, we use the market-to-sales ratio to measure value. This international benchmark enables us to examine whether multinational firms trade at a premium relative to a portfolio of firms from each of the different countries. In effect, this approach addresses the question of whether investors are better off investing in multinational firms or investing in a portfolio of domestic firms from different countries. One drawback of using the international benchmark is that while we have product market segments and geographic regions, we do not have the breakdown among both. So, for example, if a multinational's product segments are 60% computers and 40% shoes, we are forced to assume that the multinational has the same product mix throughout its various geographic segments, even though this is unlikely to be the case. In Section VI of the paper, we address this potential deficiency by excluding conglomerate firms from the sample.

Finally, for each of the two benchmarks, we remove firms where the actual value is more than four times the imputed value, or when the imputed value is more than four times the actual value. This removal is done to avoid biases associated with unrealistic outliers and is similar to the approach used in previous studies.

Results

Table 3-1 displays the summary statistics for the firms in our sample broken down by the four types of firms: single-industry -- domestic and multinational and multi-industry -- domestic and multinational. This table is also separated into four panels, with Panels A-D providing the descriptive statistics for German, Japanese, U.K., and U.S. firms respectively. For each variable, the top figure in each panel displays the mean value, below which we provide the median value in parentheses. On the right side of each panel, we provide statistical tests for differences in the mean and median value for each variable across the four firm types.

A couple of interesting patterns emerge when we compare the data for the four countries. In each of the four countries, the average conglomerate has roughly 2.5 business segments. However, the average number of geographic segments varies considerably – Japanese multinationals have the fewest geographic segments (1.6), while German multinationals have the most segments (4.0). In each country, domestic firms outnumber multinational firms – the percentage of domestic firms ranges from 66% in Germany to 85% in the United States. The percentage of single-industry firms ranges from 47% in Japan to 71% in the United States.

While the average firm characteristics are fairly similar across the four countries, some notable differences do emerge. U.S. firms generally have the highest leverage ratios, the highest market-to-sales ratios, and the highest profitability (as measured by operating income/sales). German firms, on the other hand, tend to have the lowest market-to-sales ratio but the highest level of ownership concentration. The Japanese firms in our sample are the largest on average – where size is measured in terms of both total assets and total capital.

It is also interesting to note that for each of the four countries, focused/ multinational firms have the highest market-to-sales ratios, and that the second highest ratios are found for focused/domestic firms. Moreover, this pattern (not reported) holds for each year of the sample period. These unconditional results suggest that focused firms consistently trade at higher multiples relative to conglomerates and that among focused firms, multinationals trade at higher multiples relative to domestic firms. While these results seem to indicate that geographic diversification creates value, and that product market diversification reduces value, it remains unclear whether diversification itself affects value, or whether there are other factors affecting firm value that are correlated with the level of diversification.

To get at this issue, we estimate regressions below that control for various firm characteristics. As shown in Table 3-1, within each country, there are also some significant differences between the focused and conglomerate firms and between the domestic and multinational firms. While the exact nature of these differences varies considerably, their presence suggests that it is important that our subsequent regression analyses control for these firm characteristics when analyzing the effects of industrial and geographical diversification.

Excess Value Created by Product Market and Geographic Diversification

Table 3-2 reports the mean and median excess value estimates by country for the four types of firms: single-industry -- domestic and multinational and multi-industry -- domestic and multinational. Panel A reports the results using the standard domestic benchmark to calculate imputed value, whereas Panel B reports the results using the international benchmark.

Looking first at Panel A, we see that among domestic firms in each of the four countries, focused firms significantly outperform conglomerates (see columns 1 and 3). This result is strongly consistent with earlier studies that find a product diversification discount among firms in the leading industrialized countries. However, among multinational firms, conglomerates perform significantly worse than single-industry firms in Japan and the United States (see columns 2 and 4).

Interestingly, for both Japan and the U.S., single-industry firms that are geographically diversified (single-industry, multinational) trade at premiums relative to comparable geographically focused firms (single-industry, domestic) (see columns 1 and 2). The results indicate a premium of 14.1 percent for Japanese firms and 7.8 percent for U.S. firms. By contrast, for Germany, we find that single-industry firms that are geographically diversified (multinationals) trade at a discount of 10.5 percent relative to comparable geographically focused firms (single-industry, domestic). For single-industry firms in the U.K., there is no significant difference between the value of domestic and multinational firms. Finally, geographic diversification also appears to have no significant effect on the firm value of multi-industry firms in any of the four countries (see columns 3 and 4). Overall, the results in Panel A suggest that industry diversification reduces firm value while geographic diversification potentially adds value for firms that operate in a single industry.

Turning our attention to Panel B where we use corresponding international firms as the benchmark, we see that once again industrial diversification reduces value for Japanese and U.S. firms. However, when we use the international benchmark to calculate imputed value, we find that that geographic diversification has a significant effect on excess value only for German firms. This result indicates that benchmark considerations are important in the determination and interpretation of the value associated with geographic diversification.

Looking jointly at the results from Panel A and Panel B, it appears that multinationals have higher multiples than their domestic counterparts in the same industry, but that the multinationals do not generally outperform a portfolio of domestic firms from each of the countries where they have operations.

Do Multinational Firms Outperform their Domestic Counterparts?

While the results in Table 3-2 provide an overall depiction of the value of geographic and product market diversification among the four countries, they do not control for individual firm characteristics that are also likely to affect the firm's market-to-sales ratio. These other

characteristics include the firm's size, profitability, future growth opportunities, and ownership structure. As mentioned above, previous studies have found important links between ownership concentration and firm value and between ownership concentration and the value of product market diversification. However, one drawback of incorporating ownership is that this data is available for only a subset of firms in the sample. Consequently, we have chosen to report the results both with and without ownership concentration as a control variable.

Regressions that Omit Ownership Concentration as a Control Variable

Our first set of regressions includes indicator variables corresponding to product and geographic diversification along with firm characteristics, excluding ownership concentration. Specifically, we estimate the following regression model for each of the four countries in our sample:

$$\begin{aligned}(1)\ \textit{Excess Value} = \alpha &+ \beta_1(\textit{Industry Diversification Dummy}) + \beta_2(\textit{Geographic Diversification Dummy}) \\ &+ \beta_3(\text{Relative } \textit{Log Assets}) + \beta_4(\text{Relative } \textit{Operating Income / Sales}) \\ &+ \beta_5(\text{Relative } \textit{Capital Expenditures / Sales}) + e.\end{aligned}$$

Excess value is defined to be the natural log of the ratio of the firm's market value to its imputed value. The product market diversification dummy (SEG) is equal to one for multi-segment firms and is set to zero for focused (single product) firms. The geographic diversification dummy (GEO) is equal to one for multinational firms and equals zero for domestic firms. The log of the relative assets controls for potential firm size effects. The ratio of operating income-to-sales (OIS) provides a measure of firm profitability, while the ratio of capital expenditures-to-sales (CES) proxies for the level of growth opportunities. Controlling for the other factors, we would expect to see a positive link between excess value and both OIS and CES.[4] Since our data covers five years (1991-1995), we also include separate year dummies in the regressions to control for intertemporal variations in market or economic conditions that may also affect the firm's market-to-sales ratio. Lastly, since the dependent variable is measured in relative terms, we also measure

[4] For Japan, CES is irregularly reported, and we therefore exclude it from the regression specification. When we include CES for Japan, we obtain similar results, although the sample is much smaller.

the independent variables in relative terms. In particular, the independent variables are all measured relative to the value of the weighted-average multiplier firms that form the basis for the excess value measure.

The regression results for the individual countries (not including ownership) are reported in the first four columns of Table 3-3. As expected, we find that the estimated coefficients on OIS (Relative Operating Income/Sales) and CES (Relative Capital Expenditures/Sales) are positive and frequently significant. These results confirm that firms that are more profitable and that have greater growth opportunities typically have higher market-to-sales ratios. The estimated coefficient for the log of the relative size variable is significant and negative for firms in Germany and Japan, but is significant and positive for firms in the U.K. and U.S. Although not reported, the annual dummy coefficients indicate that there is little time variation in the excess values after controlling for firm characteristics.

The estimated coefficients on the product market diversification dummy appear to be reasonable and are generally well within the ranges found in earlier studies. Among U.S. firms, we find a diversification discount of 18.4 percent, which is similar to the 14.4 percent discount found by Berger and Ofek (1995) over an earlier time period 1986-1991. Moreover, our estimated diversification discount for U.S. firms is also similar to those reported by Bodnar, Tang, and Weintrop (1998) and Denis, Denis, and Yost (1999), who also control for geographic diversification. For Japan and the U.K., we find statistically significant product market diversification discounts of 7.1 percent and 10.5 percent respectively. These diversification discounts are generally similar to those found by Lins and Servaes (1999) and Fauver, Houston, and Naranjo (1999), but neither of those studies controlled for the effects of geographic diversification. All in all, our results strongly confirm earlier findings and suggest that focused firms outperform conglomerate firms in the most developed markets.

The results also indicate that multinational firms in the United States and Japan are valued more highly than their domestic counterparts. Controlling for other factors, Japanese

multinationals trade at a 7 percent premium – the coefficient on the geographic diversification dummy (GEO) is 0.070, which is significant at the one percent level. Likewise, U.S. multinationals trade at a 5.5 percent premium – which is significant at the one percent level. This result is consistent with the findings of Bodnar, Tang, and Weintrop (1998), who also find that U.S. multinationals trade at a significant premium relative to domestic U.S. firms. However, Bodnar, Tang, and Weintrop's estimated premium of 2.2 percent is somewhat smaller than the 5.5 percent premium that we find for the firms in our sample. By contrast, German multinationals trade at a discount of 8 percent relative to German domestic firms (this difference is significant at the one percent level). Finally, geographic diversification does not appear to have a significant effect on firm value in the U.K.[5]

Regression Results Controlling for Ownership Concentration

The results discussed above suggest that corporate product diversification is costly and geographic diversification may be beneficial. A potential problem with this conclusion is that, so far, we have not explicitly controlled for agency costs associated with ownership concentration. Indeed, several studies suggest that firm value is correlated with ownership structure [e.g., Demsetz and Lehn (1985), Morck, Shleifer and Vishny (1988), Holderness and Sheehan (1998), and McConnell and Servaes (1990)] and that ownership structure varies across countries and legal systems [e.g., La Porta, Lopez-de-Silanes, Shleifer and Vishny (1997, 1998), LaPorta, Lopez-De-Silanes and Shleifer (1999), and Claessens, Djankov, Fan and Lang (1998)]. To the extent that ownership concentration affects firm value, it may also affect the estimated value of corporate diversification. This concern may be particularly relevant if there is a strong link between ownership concentration and firm value and if focused and diversified firms have significantly different levels of ownership concentration. An additional concern is that even if ownership concentration levels are similar for both focused and diversified firms, ownership

[5] As a robustness check, we also included an interaction indicator variable between the product (SEG) and geographic (GEO) diversification dummies as an explanatory variable. In each case, the interactive term was insignificantly different from zero.

concentration may still be important if it has a differential effect on the value of focused and diversified firms.

The exact link between ownership structure and firm value, however, is not entirely clear. On one hand, it is widely acknowledged that concentrated ownership is likely to reduce the conflicts that arise when there is a separation between managers and stockholders. This link suggests a positive relation between firm value and ownership concentration. On the other hand, concentrated ownership provides large investors with opportunities to exploit minority shareholders, thereby suggesting at least for some range of values a negative relation between firm value and ownership concentration. In a recent study, Holderness and Sheehan (1998) conclude that in the United States, legal constraints often effectively limit the actions of majority shareholders – but it is not clear to what extent their conclusions extend outside the U.S.

As reported in the summary statistics in Table 3-1, German firms have a significantly higher level of average ownership concentration. We also find that within each country, ownership concentration levels differ across the four firm types, although no clear patterns consistently emerge among the four countries. However, given the clear correlation between organizational structure and ownership structure, it is important that we control for ownership concentration when estimating the sources of any diversification discounts or premiums.

Similar to Morck, Shleifer, and Vishny (1988) and others, we account for the nonlinear relation between ownership structure and firm value by creating three separate ownership concentration variables:[6]

OWN0to10 = total ownership if total ownership < 0.10,

= 0.10 if total ownership 0.10;

OWN10to30 = 0 if total ownership < 0.10,

[6] Morck, Shleifer and Vishny (MSV, 1988) use 5 percent and 25 percent as their breakpoints. Given that the Worldscope databank does not generally provide firm level ownership concentration values below 5 percent (aside from the unreported values), we use a 10 percent cut-off for the first breakpoint and 30 percent as the next breakpoint to be consistent with MSV's ownership ranges.

= total ownership minus 0.10 if 0.10 total ownership < 0.30,

= 0.20 if total ownership 0.30;

OWNover30 = 0 if total ownership < 0.30,

= total ownership minus 0.30 if total ownership 0.30.

This classification suggests that the marginal impact of increased ownership concentration varies depending on whether ownership concentration is less than 10 percent, between 10 and 30 percent, and greater than 30 percent. To assess the impact of ownership concentration on the value of corporate diversification, we also interact OWN10to30 and OWNover30 with the dummy variables SEG and GEO, which equal one if the firm has multiple industry segments and has sales in more than one country.[7] Generally, we would expect a positive link between firm value and OWN0to10. Within this range, increases in ownership concentration are likely to improve managerial incentives without dramatically increasing the risks of managerial entrenchment and expropriation. For ownership concentration levels beyond ten percent, the expected results are less clear. For these firms, the benefits of increased ownership may be more than offset by the costs resulting from increased managerial entrenchment and by the potential for the expropriation of minority shareholders. Consequently, the link between OWN10to30 and OWNover30 and firm value is less clear.

The firm level regression estimates that control for ownership concentration are reported in columns 5-8 of Table 3-3. Looking at the multi-industry dummy coefficients (SEG), we find that firms that diversify along product lines in Japan, the U.S., and the U.K. continue to trade at a discount relative to focused firms. Moreover, the magnitude of the estimated coefficient increases in Japan and slightly decreases in the U.S. after controlling for ownership concentration. With the augmented specification, we still find that German multi-industry firms do no worse (or better) relative to focused firms.

[7] Note that due to singularity, we do not include OWN0to10*SEG in our specification.

Controlling for ownership concentration also has an effect on the estimated coefficients for the multi-country segment dummy (GEO). Specifically, the estimated coefficients for Japanese and U.S. firms are higher after controlling for ownership – once again confirming that Japanese and U.S. multinationals are valued more highly than their domestic counterparts. The geographic diversification coefficient for Germany is now insignificant after controlling for ownership. Finally, the estimated geographic diversification coefficient for the U.K. firms remains insignificant.

While it is not the primary focus of our analysis, the estimated coefficients for the ownership concentration are still of considerable interest. First, for low levels of ownership concentration, there is a positive link between ownership concentration and excess value for U.S. firms, while the relation is insignificant for firms in the other three countries. Second, for ownership concentration levels beyond ten percent, we generally find that increases in ownership concentration lead to a reduction in value for both focused and diversified firms. This result confirms the fact that there are both costs and benefits associated with increased ownership concentration. Finally, from the coefficients on the ownership concentration variables that are interacted with the diversification dummy (OWN10to30*SEG, OWNover30*SEG, OWN10to30*GEO, and OWNover30*GEO), we see that the effects of ownership concentration are significantly different for focused and diversified firms. For ownership concentration levels between 10 and 30 percent, excess value is significantly lower for the diversified firms, suggesting that entrenchment problems and expropriation of minority shareholders is more of a concern for diversified firms. However, beyond 30 percent, excess value is significantly higher for diversified firms. For example, a geographically diversified firm in the United States with a concentrated ownership of 35 percent would be valued 8 percent more (0.232*0.35) relative to a domestic focused firm with concentrated ownership below 10 percent. All in all, the results suggest that there is a link between ownership concentration and excess value, and that this link may be somewhat different for focused and diversified firms.

Do Multinationals Outperform a Portfolio of Domestic Firms From Different Countries?

The results in the previous section indicate that U.S. and Japanese multinationals are valued, on average, more highly than their domestic counterparts. While these results suggest that geographic diversification enhances firm value in these countries, it is unclear whether multinationals outperform a portfolio of domestic firms in the various countries in which they operate. To get at this issue, we compared multinational firms to a weighted average of firms that have the same geographic and product mix. These results are reported in Table 3-4. Once again, the regression results excluding ownership are reported in columns 1-4, while the results including ownership concentration are reported in columns 5-8.

After controlling for ownership concentration, we find that the coefficient on the geographic diversification dummy (GEO) is not significantly different from zero in each of the four countries. These results suggest that while multinational firms in the U.S. and Japan outperform their domestic counterparts, multinational firms do not outperform a simulated portfolio of international firms that mimic their overall product mix. Interestingly, these results parallel some recent findings in the international investments literature. Heston and Rouwenhorst (1994) and Griffin and Karolyi (1998), for example, suggest that while multinational firms have higher risk-adjusted returns, shareholders can duplicate these same risk-adjusted returns by holding a portfolio of domestic firms in each international market. Moreover, similar to the above studies, we also find that the value of geographic diversification largely arises from differences in performance across countries, not from differences in industry composition or clustering across countries. Interestingly, these results parallel Heston and Rouwenhorst (1994) and Griffin and Karolyi (1998) who use international indice return data, whereas we use firm level corporate data in our analysis. In another recent investments study that also parallels our results, Rowland and Tesar (1998) examine the return mean-variance efficient frontier with domestic firms, multinational firms, and international equity indices. They first find that multinational firms add risk-adjusted value to a portfolio of domestic firms. However, when the

domestic portfolio is augmented with international indices, the multinational firms do not add any additional value.

In a related stream of the international investments literature that also parallels our findings, several studies find that investors overweight their portfolios with domestic securities relative to international securities. In particular, French and Poterba (1991) and Cooper and Kaplanis (1994) among others find that there is a "home bias" towards investment in domestic securities. Given that investors are reluctant to purchase overseas investments, domestically headquartered multinational firms often serve as a method to obtain some international exposure, resulting in a potentially higher valuation of multinational firms. Therefore, one might expect that countries with relatively greater home bias would likely value multinational firms more than in countries where there is less home bias, all else equal. Given that French and Poterba (1991) find that domestic portfolio dedication (home bias) is greatest in Japan and the U.S. for the countries in our sample, we might expect that multinationals in these countries would be valued more highly. Consistent with this conjecture, we find that multinationals in Japan and the U.S. trade a premium when using the domestic benchmark. However, when using the international benchmark, the valuation premiums disappear.

Taking a Closer Look at the Single-Segment Firms

As a final test of the value of geographic diversification, we re-estimate the results for the sub-sample of focused firms that have sales in a single segment. There are two benefits that arise from eliminating the conglomerate firms from the sample. First, as we have seen, there may be important interaction effects between the value of product-market diversification and the value of geographic diversification. In this regard, eliminating the conglomerate firms removes the effects of product-market diversification, thereby potentially providing us with a cleaner test of the value of geographic diversification. Second, we indicated above that one problem with the international benchmark results reported in Table 3-4 is that data limitations forced us to assume that multinationals have the same product mix in each of their geographic regions segments, even

though this was unlikely to be the case. Once again, this concern disappears if we eliminate conglomerate firms from the sample.

The regression results for the sub-sample of single-segment firms are reported in Table 3-5. These regressions include ownership concentration as a control variable, and are estimated using both the domestic and international benchmarks for computing imputed value. These results directly parallel the domestic and international benchmark results reported earlier in Tables 3-3 and 3-4. In Table 3-5, Panel A, with the domestic benchmark, we find a geographic diversification premium in the U.S. and Japan and a geographic diversification discount in Germany. Using the international benchmark, Panel B, we find that the geographic diversification premiums and discount disappear similar to Table 3-4. Once again, this confirms the conclusion that for U.S. and Japanese firms, geographic diversification increases value, but that multinationals do not trade at a premium relative to an international portfolio of domestic firms.

Conclusion

While in recent years a large literature has examined the links between product diversification and firm value, considerably fewer studies have examined the value of geographic diversification. The lack of work in this area is surprising given the dramatic growth in foreign investment among firms in the leading industrialized countries over the past twenty-five years.

In this paper, we investigate the connection between product and geographic diversification and its impact on firm value. We gather data on more than 4,000 firms from four highly industrialized countries (Germany, Japan, the U.K., and the U.S.). On average, we find that the geographic diversification neither enhances nor reduces the value of multinationals located in Germany and the United Kingdom. However, our results suggest that geographic diversification does significantly enhance the value of multinational firms in Japan and the United States. These results suggest that multinationals in these countries are able to capture valuable operating synergies or generate benefits from risk reduction. However, we also find that in all

four countries, multinationals typically do not outperform an international portfolio of domestic firms.

Interestingly, our results parallel some recent findings in the international investments literature. Recent studies by Heston and Rouwenhorst (1994), Griffin and Karolyi (1998), and Rowland and Tesar (1998), for instance, find that while multinational firms have higher risk-adjusted returns, shareholders can duplicate these same risk-adjusted returns by holding a portfolio of domestic firms in each international market. Overall, our results suggest that there are important interactions between the value of product market diversification and geographic diversification and that future studies need to consider both forms of diversification when investigating the links between diversification and firm value.

Table 3-1
Summary Statistics by Industrial and Geographical Diversification: 1991 – 1995

Panel A: German Firms

Firm Level Characteristics by Industrial and Geographical Diversification	Single-Industry Firms		Multi-Industry Firms	
	Domestic (1)	Multinational (2)	Domestic (3)	Multinational (4)
Number of Industrial Segments	1 (1)	1 (1)	2.713 (2)	2.550 (2)
Number of Geographical Segments	1 (1)	4.037 (4)	1 (1)	3.759 (3)
Total Assets (mil $)	1,550 (220)	564 (153)	4,420 (683)	1,400 (365)
Total Capital (mil $)	531 (89)	259 (57)	1,460 (273)	450 (147)
Leverage Ratio	0.193 (0.168)	0.203 (0.181)	0.185 (0.144)	0.227 (0.157)
Operating Income/Sales	0.053 (0.059)	0.048 (0.061)	0.044 (0.046)	0.043 (0.046)
Capital Expenditure/Sales	0.082 (0.055)	0.078 (0.056)	0.075 (0.055)	0.065 (0.050)
Ownership Concentration	0.612 (0.650)	0.619 (0.700)	0.505 (0.514)	0.574 (0.660)
Market/Sales	0.785 (0.597)	0.842 (0.557)	0.656 (0.463)	0.702 (0.540)
Observations	538	272	366	191

Panel A--continued

Firm Level Characteristics by Industrial and Geographical Diversification	Test of Statistical Differences p-values					
	(1)-(2)	(1)-(3)	(1)-(4)	(2)-(3)	(2)-(4)	(3)-(4)
Number of Industrial Segments						
Number of Geographical Segments						
Total Assets (mil $)	0.000 (0.001)	0.000 (0.000)	0.707 (0.000)	0.000 (0.000)	0.008 (0.000)	0.000 (0.000)
Total Capital (mil $)	0.002 (0.005)	0.000 (0.000)	0.534 (0.001)	0.000 (0.000)	0.087 (0.000)	0.000 (0.001)
Leverage Ratio	0.412 (0.452)	0.407 (0.809)	0.093 (0.229)	0.143 (0.346)	0.263 (0.592)	0.038 (0.224)
Operating Income/Sales	0.641 (0.882)	0.120 (0.021)	0.182 (0.081)	0.732 (0.078)	0.699 (0.080)	0.908 (0.766)
Capital Expenditure/Sales	0.601 (0.766)	0.313 (1.000)	0.005 (0.159)	0.719 (0.873)	0.080 (0.080)	0.131 (0.028)
Ownership Concentration	0.761 (0.040)	0.000 (0.004)	0.131 (0.773)	0.000 (0.001)	0.122 (0.093)	0.013 (0.018)
Market/Sales	0.529 (0.457)	0.000 (0.000)	0.157 (0.215)	0.035 (0.006)	0.139 (0.807)	0.412 (0.024)
Observations						

Panel B: Japanese Firms

Firm Level Characteristics by Industrial and Geographical Diversification	Single-Industry Firms		Multi-Industry Firms	
	Domestic (1)	Multinational (2)	Domestic (3)	Multinational (4)
Number of Industrial Segments	1 (1)	1 (1)	2.536 (2)	2.569 (2)
Number of Geographical Segments	1 (1)	1.689 (2)	1 (1)	1.658 (2)
Total Assets (mil $)	3,010 (406)	2,070 (297)	3,450 (401)	1,230 (299)
Total Capital (mil $)	1,850 (214)	992 (195)	1,540 (202)	530 (146)
Leverage Ratio	0.265 (0.242)	0.241 (0.216)	0.282 (0.270)	0.264 (0.250)
Operating Income/Sales	0.084 (0.076)	0.078 (0.073)	0.075 (0.067)	0.079 (0.069)
Capital Expenditure/Sales				
Ownership Concentration	0.266 (0.226)	0.251 (0.214)	0.267 (0.236)	0.293 (0.252)
Market/Sales	1.176 (0.944)	1.241 (1.063)	1.054 (0.841)	1.034 (0.857)
Observations	1,585	225	1,802	260

Panel B--continued

Firm Level Characteristics by Industrial and Geographical Diversification	Test of Statistical Differences p-values					
	(1)-(2)	(1)-(3)	(1)-(4)	(2)-(3)	(2)-(4)	(3)-(4)
Number of Industrial Segments						
Number of Geographical Segments						
Total Assets (mil $)	0.028 (0.005)	0.231 (0.851)	0.000 (0.062)	0.001 (0.006)	0.039 (0.818)	0.000 (0.063)
Total Capital (mil $)	0.000 (0.354)	0.144 (0.547)	0.000 (0.016)	0.001 (0.530)	0.003 (0.221)	0.000 (0.024)
Leverage Ratio	0.060 (0.078)	0.014 (0.007)	0.930 (0.875)	0.002 (0.001)	0.164 (0.105)	0.159 (0.201)
Operating Income/Sales	0.215 (0.354)	0.000 (0.000)	0.217 (0.084)	0.466 (0.040)	0.970 (0.297)	0.419 (0.596)
Capital Expenditure/Sales						
Ownership Concentration	0.260 (0.571)	0.881 (0.521)	0.038 (0.136)	0.228 (0.567)	0.015 (0.270)	0.045 (0.422)
Market/Sales	0.268 (0.075)	0.000 (0.000)	0.002 (0.144)	0.001 (0.002)	0.003 (0.020)	0.670 (0.791)
Observations						

Panel C: U.K. Firms

Firm Level Characteristics by Industrial and Geographical Diversification	Single-Industry Firms		Multi-Industry Firms	
	Domestic (1)	Multinational (2)	Domestic (3)	Multinational (4)
Number of Industrial Segments	1 (1)	1 (1)	2.657 (2)	2.553 (2)
Number of Geographical Segments	1 (1)	3.651 (4)	1 (1)	3.790 (4)
Total Assets (mil $)	847 (68)	579 (54)	1,480 (169)	556 (90)
Total Capital (mil $)	514 (34)	385 (27)	844 (90)	337 (54)
Leverage Ratio	0.198 (0.165)	0.208 (0.167)	0.222 (0.199)	0.214 (0.184)
Operating Income/Sales	0.121 (0.101)	0.117 (0.101)	0.102 (0.095)	0.112 (0.101)
Capital Expenditure/Sales	0.084 (0.039)	0.109 (0.035)	0.057 (0.038)	0.072 (0.037)
Ownership Concentration	0.359 (0.351)	0.397 (0.377)	0.266 (0.239)	0.303 (0.294)
Market/Sales	1.151 (0.800)	1.235 (0.804)	0.936 (0.749)	1.137 (0.751)
Observations	2,048	789	1,412	476

Panel C--continued

Firm Level Characteristics by Industrial and Geographical Diversification	Test of Statistical Differences p-values					
	(1)-(2)	(1)-(3)	(1)-(4)	(2)-(3)	(2)-(4)	(3)-(4)
Number of Industrial Segments						
Number of Geographical Segments						
Total Assets (mil $)	0.063 (0.009)	0.000 (0.000)	0.029 (0.003)	0.000 (0.000)	0.883 (0.000)	0.000 (0.000)
Total Capital (mil $)	0.184 (0.001)	0.000 (0.000)	0.050 (0.000)	0.000 (0.000)	0.674 (0.000)	0.000 (0.000)
Leverage Ratio	0.317 (0.395)	0.014 (0.000)	0.186 (0.004)	0.241 (0.000)	0.676 (0.067)	0.543 (0.118)
Operating Income/Sales	0.497 (0.976)	0.000 (0.009)	0.235 (0.919)	0.004 (0.192)	0.512 (0.890)	0.237 (0.138)
Capital Expenditure/Sales	0.007 (0.124)	0.000 (0.368)	0.061 (0.309)	0.000 (0.203)	0.000 (0.342)	0.005 (0.525)
Ownership Concentration	0.000 (0.029)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.003 (0.000)
Market/Sales	0.117 (0.957)	0.000 (0.019)	0.813 (0.019)	0.000 (0.054)	0.168 (0.051)	0.001 (0.915)
Observations						

Panel D: U.S. Firms

Firm Level Characteristics by Industrial and Geographical Diversification	Single-Industry Firms		Multi-Industry Firms	
	Domestic (1)	Multinational (2)	Domestic (3)	Multinational (4)
Number of Industrial Segments	1 (1)	1 (1)	2.428 (2)	2.373 (2)
Number of Geographical Segments	1 (1)	2.668 (3)	1 (1)	2.688 (3)
Total Assets (mil $)	1,470 (247)	807 (163)	3,350 (559)	971 (265)
Total Capital (mil $)	909 (171)	531 (120)	1,740 (358)	616 (180)
Leverage Ratio	0.253 (0.234)	0.247 (0.207)	0.278 (0.260)	0.279 (0.276)
Operating Income/Sales	0.144 (0.132)	0.157 (0.140)	0.134 (0.125)	0.131 (0.123)
Capital Expenditure/Sales	0.091 (0.049)	0.107 (0.049)	0.077 (0.045)	0.084 (0.046)
Ownership Concentration	0.283 (0.248)	0.295 (0.271)	0.241 (0.189)	0.285 (0.245)
Market/Sales	1.730 (1.230)	1.980 (1.305)	1.343 (0.994)	1.387 (0.954)
Observations	6,891	1,313	2,840	426

Panel D--continued

Firm Level Characteristics by Industrial and Geographical Diversification	Test of Statistical Differences p-values					
	(1)-(2)	(1)-(3)	(1)-(4)	(2)-(3)	(2)-(4)	(3)-(4)
Number of Industrial Segments						
Number of Geographical Segments						
Total Assets (mil $)	0.000	0.000	0.000	0.000	0.201	0.000
	(0.000)	(0.000)	(0.616)	(0.000)	(0.000)	(0.000)
Total Capital (mil $)	0.000	0.000	0.000	0.000	0.280	0.000
	(0.000)	(0.000)	(0.840)	(0.000)	(0.001)	(0.000)
Leverage Ratio	0.398	0.000	0.011	0.000	0.006	0.892
	(0.026)	(0.000)	(0.002)	(0.000)	(0.000)	(0.642)
Operating Income/Sales	0.009	0.021	0.039	0.000	0.000	0.631
	(0.028)	(0.002)	(0.073)	(0.000)	(0.005)	(0.603)
Capital Expenditure/Sales	0.008	0.000	0.258	0.000	0.005	0.238
	(0.833)	(0.006)	(0.058)	(0.114)	(0.097)	(0.917)
Ownership Concentration	0.127	0.000	0.852	0.000	0.516	0.002
	(0.034)	(0.000)	(0.742)	(0.000)	(0.128)	(0.001)
Market/Sales	0.000	0.000	0.000	0.000	0.000	0.478
	(0.024)	(0.000)	(0.000)	(0.000)	(0.000)	(0.467)
Observations						

Panels A-D provide firm level descriptive statistics for German, Japanese, U.K., and U.S. firms respectively. The upper number in each cell reports the mean value for each variable, while the lower number in parentheses reports the median value for each variable. T-tests are used to test for differences in each respective mean value, while Wilcoxon rank-sum tests are used to test for differences in the median values. Single-industry firms are firms that operate in only one two-digit SIC code industry, while multi-industry firms are defined as firms that operate in two or more two-digit SIC code industries and no firm segment sales exceed 90% of total firm sales. Domestic firms are defined as firms that have over 90% of their total firm sales in their home market, while multinational firms are defined as firms that have more than 10% of their total sales outside their home market. The leverage ratio is defined as book value of debt divided by total assets. Ownership concentration is defined as the sum of individual and/or institutional ownership holdings that are equal to or exceed five percent of a firm's common stock. Due to missing ownership concentration data, the number of observations is slightly less than that for the other reported variables. Market-to-sales is defined as the ratio of a firm's market value of equity plus book value of debt to its total sales.

Table 3-2
Excess Values by Industrial and Geographical Diversification: 1991 – 1995

Panel A: Domestic Benchmark

Excess Value by Country	Single-Industry Firms		Multi-Industry Firms	
	Domestic (1)	Multinational (2)	Domestic (3)	Multinational (4)
German	0.027	-0.078	-0.057	-0.020
	(0.000)	(-0.070)	(-0.078)	(-0.007)
Japanese	0.000	0.141	-0.051	-0.038
	(0.000)	(0.118)	(-0.074)	(0.018)
U.K.	0.001	-0.009	-0.085	-0.055
	(0.000)	(-0.027)	(-0.093)	(-0.086)
U.S.	-0.020	0.058	-0.172	-0.151
	(-0.014)	(0.060)	(-0.174)	(-0.200)

Panel A--continued

Excess Value by Country	Test of Statistical Differences p-values					
	(1)-(2)	(1)-(3)	(1)-(4)	(2)-(3)	(2)-(4)	(3)-(4)
German	0.008	0.019	0.324	0.631	0.292	0.484
	(0.011)	(0.003)	(0.816)	(0.749)	(0.146)	(0.122)
Japanese	0.000	0.007	0.314	0.000	0.001	0.738
	(0.003)	(0.000)	(0.781)	(0.000)	(0.160)	(0.289)
U.K.	0.712	0.000	0.059	0.006	0.181	0.333
	(0.229)	(0.000)	(0.084)	(0.044)	(0.365)	(0.672)
U.S.	0.000	0.000	0.000	0.000	0.000	0.492
	(0.003)	(0.000)	(0.000)	(0.000)	(0.000)	(0.592)

Panel B: International Benchmark

Excess Value by Country	Single-Industry Firms		Multi-Industry Firms	
	Domestic (1)	Multinational (2)	Domestic (3)	Multinational (4)
German	0.024	-0.017	0.028	0.282
	(0.000)	(0.044)	(0.045)	(0.244)
Japanese	-0.127	-0.105	-0.173	-0.031
	(-0.133)	(-0.213)	(-0.176)	(0.021)
U.K.	-0.002	-0.123	0.020	-0.107
	(0.000)	(-0.135)	(0.028)	(-0.164)
U.S.	-0.028	-0.038	-0.060	-0.007
	(-0.024)	(-0.047)	(-0.060)	(-0.074)

Panel B--continued

Excess Value by Country	Test of Statistical Differences p-values					
	(1)-(2)	(1)-(3)	(1)-(4)	(2)-(3)	(2)-(4)	(3)-(4)
German	0.583	0.943	0.007	0.592	0.010	0.011
	(0.901)	(0.956)	(0.005)	(0.827)	(0.010)	(0.027)
Japanese	0.748	0.063	0.273	0.340	0.504	0.112
	(0.809)	(0.052)	(0.237)	(0.383)	(0.471)	(0.107)
U.K.	0.015	0.454	0.082	0.009	0.833	0.048
	(0.014)	(0.317)	(0.080)	(0.007)	(0.841)	(0.044)
U.S.	0.790	0.096	0.817	0.612	0.750	0.568
	(0.809)	(0.140)	(0.767)	(0.654)	(0.755)	(0.566)

Panel A contains the excess values using the domestic firm benchmarks, while Panel B contains the excess values from using the corresponding international firm benchmarks. With the international benchmark, the firm's imputed performance is based on a weighted average of the imputed values for the various countries in which the firm operates. The upper number in each cell reports the mean value for each variable, while the lower number in parentheses reports the median value for each variable. T-tests are used to test for differences in each respective mean value, while Wilcoxon rank-sum tests are used to test for differences in the median values. Excess value is defined as the natural logarithm of the ratio of a firm's market-to-sales ratio to its imputed market-to-sales ratio. Firms with excess values that are greater than four or less than one-fourth are eliminated from the sample. Single-industry firms are firms that operate in only one two-digit SIC code industry, while multi-industry firms are defined as firms that operate in two or more two-digit SIC code industries and no firm segment sales exceed 90% of total firm sales. Domestic firms are defined as firms that have over 90% of their total firm sales in their home market, while multinational firms are defined as firms that have more than 10% of their total sales outside their home market.

Table 3-3
Multivariate Regression Estimates of Excess Values Using the Domestic Benchmark:
1991 – 1995

Variables	German (1)	Japanese (2)	U.K. (3)	U.S. (4)
Constant	0.096***	0.132***	-0.344***	-0.236***
	(-2.59)	(5.64)	(-9.37)	(-13.20)
Multi-Industry Segment Dummy (SEG)	0.000	-0.071***	-0.105***	-0.184***
	(-0.01)	(-4.07)	(-6.11)	(-15.28)
Multi-Country Segment Dummy (GEO)	-0.080***	0.070***	0.019	0.055***
	(-2.58)	(2.58)	(1.03)	(3.49)
Relative Operating Income-to-Sales (OIS)	0.030***	0.024***	0.200***	0.020**
	(4.56)	(2.67)	(6.34)	(2.93)
Relative Capital Expenditures-to-Sales (CES)	0.052***	———	0.006	0.082***
	(4.85)		(1.19)	(10.44)
Relative Total Assets (ASSETS)	0.112***	-0.065***	0.048***	0.037***
	(-5.71)	(-5.97)	(3.86)	(4.29)
Adjusted R^2	0.09	0.06	0.15	0.08
Number of Observations	1,367	3,872	4,725	11,470

Table 3-3--continued

Variables	German (5)	Japanese (6)	U.K. (7)	U.S. (8)
Constant	-0.095	0.176***	-0.225***	-0.194***
	(-1.38)	(5.06)	(-4.78)	(-8.24)
Multi-Industry Segment	-0.033	-0.168***	-0.076**	-0.170***
Dummy (SEG)	(-0.42)	(-6.21)	(-2.34)	(-8.25)
Multi-Country Segment	-0.130	0.116***	0.018	0.122***
Dummy (GEO)	(-1.52)	(2.73)	(0.43)	(4.28)
Relative Operating	0.032**	0.025***	0.201***	0.022***
Income-to-Sales (OIS)	(4.71)	(2.63)	(5.45)	(2.80)
Relative Capital	0.046**	———	0.011*	0.074***
Expenditures-to-Sales	(4.71)		(1.88)	(8.95)
(CES)				
Relative Total Assets	0.118**	-0.067***	0.004	0.024**
(ASSETS)	(-5.85)	(-5.73)	(0.29)	(2.39)
Ownership Concentration	-0.457	0.234	-0.168	0.393*
< 10 (OWN0to10)	(-0.46)	(0.68)	(-0.46)	(1.80)
Ownership Concentration	0.851	-0.194	-0.389*	-0.419***
10-30 (OWN10to30)	(1.35)	(-0.93)	(-1.83)	(-3.06)
Ownership Concentration	0.240**	-0.631***	-0.230**	-0.083
> 30 (OWNover30)	(-2.37)	(-3.45)	(-2.15)	(-1.22)
Ownership Concentration	-1.004*	0.651**	-0.390	-0.220
10-30 interacted with	(-1.86)	(2.41)	(-1.49)	(-1.20)
SEG (OWN10to30*SEG)				
Ownership Concentration	0.673***	0.453*	-0.104	0.123
> 30 interacted with SEG	(4.14)	(1.80)	(-0.63)	(1.08)
(OWNover30*SEG)				
Ownership Concentration	0.277	-0.463	-0.161	-0.609**
10-30 interacted with	(0.46)	(-1.12)	(-0.52)	(-2.54)
GEO				
(OWN10to30*GEO)				
Ownership Concentration	-0.056	-0.034	0.204	0.232*
> 30 interacted with GEO	(-0.32)	(-0.09)	(1.15)	(1.66)
(OWNover30*GEO)				
Adjusted R^2	0.11	0.07	0.17	0.08
Number of Observations	1,255	3,817	3,823	8,803

Significant at 1 percent (***), 5 percent (**), and 10 percent (*) levels, Robust-White t-statistics in parentheses.

Regression estimates are from 1991-1995. Excess value is defined as the natural logarithm of the ratio of a firm's market-to-sales ratio to its imputed market-to-sales ratio. With the domestic benchmark, the firm's imputed performance is based on a weighted average of the corresponding pure plays within the domestic market. Firms with excess values that are greater than four or less than one-fourth are eliminated from the sample. The industry diversification dummy, SEG, is equal to one for firms who operate in more than one industry and zero otherwise. Multi-industry firms are defined as firms that operate in two or more two-digit SIC code industries and no firm segment sales exceed 90% of total firm sales. The multinational diversification dummy, GEO, is equal to one for firms who operate in more than one country and zero otherwise. Multinational firms are defined as firms that operate in two or more countries and no firm segment sales in a particular country exceed 90% of total firm sales. OIS is defined as the firm's operating income-

to-sales, while CES is the firm's capital expenditures-to-sales. For Japan, we omit the CES variable from the specification due to infrequently reported figures. Assets are defined as the natural logarithm of the firm's total assets. The independent variables OIS, CES, and ASSETS are all measured relative to the value of the weighted-average multiplier firms that form the basis for the excess value measure. Ownership concentration is defined as the sum of individual and/or institutional ownership holdings that are equal to or exceed five percent of a firm's common stock. OWN0to10: = *total ownership* if total ownership < 0.10, = *0.10* if total ownership $\geq$ 0.10; OWN10to30: = *0* if total ownership < 0.10, = *total ownership minus 0.10* if $0.10 \leq$ total ownership < 0.30, = *0.20* if total ownership ≥ 0.30; OWNover30: = *0* if total ownership < 0.30, = *total ownership minus 0.30* if total ownership ≥ 0.30. Each model specification also includes year dummies for 1992-1995.

Table 3-4
Multivariate Regression Estimates of Excess Values Using the International Benchmark:
1991 – 1995

Variables	German (1)	Japanese (2)	U.K. (3)	U.S. (4)
Constant	-0.071	-0.160***	-0.421***	-0.259***
	(-1.52)	(-3.75)	(-7.64)	(-12.29)
Multi-Industry Segment	0.052	-0.047**	-0.009	-0.048***
Dummy (SEG)	(1.15)	(-2.09)	(-0.34)	(-2.71)
Multi-Country Segment	0.033	0.051	-0.124***	-0.015
Dummy (GEO)	(0.54)	(1.04)	(-3.59)	(-0.44)
Relative Operating	0.013*	0.219***	0.283***	0.017**
Income-to-Sales (OIS)	(1.72)	(6.38)	(6.67)	(2.29)
Relative Capital	0.046***	———	0.010	0.098***
Expenditures-to-Sales	(2.98)		(0.72)	(10.25)
(CES)				
Relative Total Assets	-0.081***	-0.052***	0.054***	0.035***
(ASSETS)	(-3.27)	(-4.11)	(3.33)	(3.32)
Adjusted R^2	0.07	0.12	0.22	0.08
Number of Observations	778	2,509	2,739	7,901

Table 3-4--continued

Variables	German (5)	Japanese (6)	U.K. (7)	U.S. (8)
Constant	-0.074	-0.126**	-0.321***	-0.210***
	(-0.89)	(-2.14)	(-4.61)	(-7.61)
Multi-Industry Segment	-0.047	-0.124***	-0.035	-0.028
Dummy (SEG)	(-0.40)	(-3.48)	(-0.76)	(-0.94)
Multi-Country Segment	-0.106	0.040	0.006	0.053
Dummy (GEO)	(-1.28)	(0.45)	(0.08)	(1.01)
Relative Operating	0.017*	0.248***	0.278***	0.013*
Income-to-Sales (OIS)	(1.82)	(6.62)	(5.51)	(1.82)
Relative Capital	0.043***	———	0.030***	0.097***
Expenditures-to-Sales	(2.85)		(3.54)	(8.63)
(CES)				
Relative Total Assets	-0.097***	-0.057***	0.010	0.023*
(ASSETS)	(-3.69)	(-4.12)	(0.52)	(1.92)
Ownership Concentration	-0.023	0.111	-0.267	0.459*
< 10 (OWN0to10)	(-0.02)	(0.26)	(-0.61)	(1.74)
Ownership Concentration	0.358	-0.276	-0.350	-0.482***
10-30 (OWN10to30)	(0.48)	(-1.22)	(-1.50)	(-3.14)
Ownership Concentration	-0.171	-0.447**	-0.208	-0.040
> 30 (OWNover30)	(-1.62)	(-2.54)	(-1.72)	(-0.55)
Ownership Concentration	-0.522	0.519	-0.308	-0.337
10-30 interacted with SEG	(-0.63)	(1.51)	(-0.80)	(-1.23)
(OWN10to30*SEG)				
Ownership Concentration	0.672***	0.241	0.298	0.352**
> 30 interacted with SEG	(2.72)	(0.76)	(1.03)	(2.19)
(OWNover30*SEG)				
Ownership Concentration	0.132	0.410	-0.638	-0.537
10-30 interacted with GEO	(0.13)	(0.45)	(-1.12)	(-1.14)
(OWN10to30*GEO)				
Ownership Concentration	0.104	-0.387	-0.078	0.136
> 30 interacted with GEO	(0.31)	(-0.53)	(-0.26)	(0.48)
(OWNover30*GEO)				
Adjusted R^2	0.09	0.14	0.24	0.08
Number of Observations	703	2,480	2,224	6,076

Significant at 1 percent (***), 5 percent (**), and 10 percent (*) levels, Robust-White t-statistics in parentheses.

Regression estimates are from 1991-1995. Excess value is defined as the natural logarithm of the ratio of a firm's market-to-sales ratio to its imputed market-to-sales ratio. With the international benchmark, the firm's imputed performance is based on a weighted average of the imputed values for the various countries in which the firm operates. Firms with excess values that are greater than four or less than one-fourth are eliminated from the sample. The industry diversification dummy, SEG, is equal to one for firms who operate in more than one industry and zero otherwise. Multi-industry firms are defined as firms that operate in two or more two-digit SIC code industries and no firm segment sales exceed 90% of total firm sales. The multi-country diversification dummy, GEO, is equal to one for firms who operate in more than one country and zero otherwise. Multi-country firms are defined as firms that operate in two or more countries and no firm segment sales in a particular country exceed 90% of total firm sales. OIS is defined as the firm's operating income-to-sales, while CES is the firm's capital expenditures-to-sales.

For Japan, we omit the CES variable from the specification due to infrequently reported figures. Assets are defined as the natural logarithm of the firm's total assets. The independent variables OIS, CES, and ASSETS are all measured relative to the value of the weighted-average multiplier firms that form the basis for the excess value measure. Ownership concentration is defined as the sum of individual and/or institutional ownership holdings that are equal to or exceed five percent of a firm's common stock. OWN0to10: = *total ownership* if total ownership < 0.10, = *0.10* if total ownership ≥ 0.10; OWN10to30: = *0* if total ownership < 0.10, = *total ownership minus 0.10* if $0.10 \leq$ total ownership < 0.30, = *0.20* if total ownership ≥ 0.30; OWNover30: = *0* if total ownership < 0.30, = *total ownership minus 0.30* if total ownership ≥ 0.30. Each model specification also includes year dummies for 1992-1995.

Table 3-5
Multivariate Regression Estimates of Excess Values Using Only Pure-Play (SEG=0) Firms:
1991 – 1995

Panel A: Domestic Benchmark

Variables	German (1)	Japanese (2)	U.K. (3)	U.S. (4)
Constant	-0.083 (-1.02)	0.194*** (3.74)	-0.348*** (-5.85)	-0.211*** (-7.35)
Multi-Industry Segment Dummy (SEG)	———	———	———	———
Multi-Country Segment Dummy (GEO)	-0.235** (-2.27)	0.249*** (4.61)	-0.024 (-0.40)	0.122*** (3.77)
Relative Operating Income-to-Sales (OIS)	0.036*** (3.73)	0.070*** (2.65)	0.226*** (5.82)	0.018** (2.13)
Relative Capital Expenditures-to-Sales (CES)	0.042*** (3.45)	———	0.057*** (6.42)	0.083*** (7.04)
Relative Total Assets (ASSETS)	-0.128*** (-4.63)	-0.053*** (-2.59)	-0.021 (-1.08)	0.024* (1.88)
Ownership Concentration < 10 (OWN0to10)	3.504** (2.34)	-1.326*** (-2.90)	0.424 (0.88)	0.993*** (3.74)
Ownership Concentration 10-30 (OWN10to30)	-1.328* (-1.73)	0.314 (1.37)	-0.545** (-2.29)	-0.624*** (-4.16)
Ownership Concentration > 30 (OWNover30)	-0.131 (-1.22)	-0.735*** (-3.93)	-0.257*** (-2.27)	-0.078 (-1.10)
Ownership Concentration 10-30 interacted with SEG (OWN10to30*SEG)	———	———	———	———
Ownership Concentration > 30 interacted with SEG (OWNover30*SEG)	———	———	———	———
Ownership Concentration 10-30 interacted with GEO (OWN10to30*GEO)	1.229 (1.59)	-1.533** (-2.52)	-0.273 (-0.65)	-0.627** (-2.21)
Ownership Concentration > 30 interacted with GEO (OWNover30*GEO)	-0.281 (-1.24)	0.636 (0.95)	0.374* (1.74)	0.340** (2.01)
Adjusted R^2	0.12	0.09	0.22	0.07
Number of Observations	759	1,785	2,269	6,271

Panel B: International Benchmark

Variables	German (5)	Japanese (6)	U.K. (7)	U.S. (8)
Constant	-0.069	-0.091	-0.384***	-0.207***
	(-0.80)	(-1.38)	(-4.93)	(-6.97)
Multi-Industry Segment Dummy (SEG)	———	———	———	———
Multi-Country Segment Dummy (GEO)	-0.106	0.087	0.099	0.026
	(-1.18)	(0.82)	(1.05)	(0.46)
Relative Operating Income-to-Sales (OIS)	0.016*	0.251***	0.255***	0.010
	(1.66)	(6.60)	(4.42)	(1.54)
Relative Capital Expenditures-to-Sales (CES)	0.030**	———	0.057***	0.094***
	(2.04)		(5.55)	(7.73)
Relative Total Assets (ASSETS)	-0.134***	-0.046***	0.002	0.030**
	(-4.31)	(-2.81)	(0.09)	(2.14)
Ownership Concentration < 10 (OWN0to10)	2.714*	-0.589	0.456	0.821***
	(1.73)	(-1.07)	(0.91)	(2.83)
Ownership Concentration 10-30 (OWN10to30)	-0.929	-0.053	-0.520**	-0.588***
	(-1.25)	(-0.22)	(-2.12)	(-3.65)
Ownership Concentration > 30 (OWNover30)	-0.147	-0.505***	-0.216*	-0.041
	(-1.39)	(-2.84)	(-1.77)	(-0.57)
Ownership Concentration 10-30 interacted with SEG (OWN10to30*SEG)	———	———	———	———
Ownership Concentration > 30 interacted with SEG (OWNover30*SEG)	———	———	———	———
Ownership Concentration 10-30 interacted with GEO (OWN10to30*GEO)	0.902	-0.767	-1.411**	-0.664
	(0.71)	(-0.73)	(-2.12)	(-1.29)
Ownership Concentration > 30 interacted with GEO (OWNover30*GEO)	-0.199	0.495	0.080	0.393
	(-0.46)	(0.55)	(0.24)	(1.32)
Adjusted R^2	0.10	0.14	0.25	0.08
Number of Observations	517	1,537	1,684	5,131

Significant at 1 percent (***), 5 percent (**), and 10 percent (*) levels, Robust-White t-statistics in parentheses.

Regression estimates are from 1991-1995. Industrially diversified firms (SEG=1) are excluded from the sample. Excess value is defined as the natural logarithm of the ratio of a firm's market-to-sales ratio to its imputed market-to-sales ratio. With the domestic benchmark, the firm's imputed performance is based on a weighted average of the corresponding pure plays within the domestic market. The firm's imputed performance with the international benchmark is based on a weighted average of the imputed values for the various countries in which the firm operates. Firms with excess values that are greater than four or less than one-fourth are eliminated from the sample. The industry diversification dummy, SEG, is equal to one for firms who operate in more than one industry and zero otherwise. Multi-industry firms are defined as firms that operate in two or more two-digit SIC code industries and no firm segment sales exceed 90% of total firm sales. The multi-country diversification dummy, GEO, is equal to one for firms who operate in more than one country and zero otherwise. Multi-country firms are defined as firms that operate

in two or more countries and no firm segment sales in a particular country exceed 90% of total firm sales. OIS is defined as the firm's operating income-to-sales, while CES is the firm's capital expenditures-to-sales. For Japan, we omit the CES variable from the specification due to infrequently reported figures. Assets are defined as the natural logarithm of the firm's total assets. The independent variables OIS, CES, and ASSETS are all measured relative to the value of the weighted-average multiplier firms that form the basis for the excess value measure. Ownership concentration is defined as the sum of individual and/or institutional ownership holdings that are equal to or exceed five percent of a firm's common stock. OWN0to10: = *total ownership* if total ownership < 0.10, = *0.10* if total ownership ≥ 0.10; OWN10to30: = *0* if total ownership < 0.10, = *total ownership minus 0.10* if $0.10 \leq$ total ownership < 0.30, = *0.20* if total ownership ≥ 0.30; OWNover30: = *0* if total ownership < 0.30, = *total ownership minus 0.30* if total ownership ≥ 0.30. Each model specification also includes year dummies for 1992-1995.

CHAPTER 4
FIRM VALUE AND DERIVATIVE USAGE

Introduction

Several recent studies find that focused firms are generally more valuable than firms that are diversified along product lines. Berger and Ofek (1995), for instance, find that U.S. firms trade at discounts ranging from 13 to 15 percent during 1986-1991. Extending this evidence internationally, Lins and Servaes (1999) and Fauver, Houston and Naranjo (1999) also find that diversified firms in developed economies generally trade at valuation discounts relative to focused firms in those markets. While there are potential benefits to diversification, such as the ability to effectively use internal capital markets and other firm resources as well as potential tax benefits from leverage, the empirical evidence largely suggests that the costs of diversification generally outweigh these benefits.[1] Berger and Ofek (1995), Scharfstein and Stein (1997), Stein (1998), and Rajan, Servaes and Zingales (1997) among other researchers show that the key costs of diversification arise from agency costs associated with intra-firm coordination problems that result in inefficient investment and cross-subsidization.

The valuation effects associated with derivative usage by diversified firms also presents some potentially interesting insights into the magnitude of agency costs as a consequence of firm organizational form. That is, while the organizational structure of diversified firms provides some insights into the magnitude of potentially hedgeable risks that the firm may be exposed to, it also provides some additional insights into the magnitude of agency costs associated with derivative usage and corporate diversification. The agency costs associated with derivative usage are particularly relevant in light of several well-publicized cases of losses incurred by firms as a

[1] An exception to this evidence is Fauver, Houston, and Naranjo (1999) who find that the benefits from diversification outweigh the costs for firms in less-developed capital markets.

result of their derivative trading practices. Because of these losses, there has been a significant increase in the attention paid to the risk management practices of corporations.[2]

The theoretical literature indicates that firm management uses derivative instruments for several reasons including tax motives, reduction in bankruptcy costs, and leverage, asymmetric information and moral hazard stories among others. Smith and Stulz (1985), for example, show that firms may hedge because of taxes and the transaction costs of financial distress. Hedging smoothes cash flows according to Froot, Scharfstein, and Stein (1993), which allows the firm to invest in projects when most needed. Myers (1977) and Stulz (1990) reasons that hedging may also diminish the investment distortions compared to debt financing. Stulz (1984) also argues that a manager's desire to reduce the volatility of their income may lead to managers hedging on behalf of the firm. Managers may also hedge to signal their own ability and expected payoff of a project to the market. Breeden and Viswanathan (1990), and Demarzo and Duffie (1995) propose this argument for derivative usage by firm managers.

In terms of the empirical evidence, Tufano (1996) explores the gold industry and finds supporting evidence that managers hedge for risk aversion reasons. Haushlater (1997) utilizes the oil and gas industry to support the conclusions of Smith and Stulz (1984) in which firms hedge to reduce bankruptcy costs. Geczy, Minton, and Schrand (1997) determine that currency derivative usage and growth opportunities are positively correlated, which supports the arguments made by Froot, Scharfstein, and Stein (1993). Mayers and Smith (1982, 1987) provide hedging evidence from the insurance industry and show that insurance reduces bankruptcy costs, lowers debt contracting, decreases the expected tax burden, and transfers risk to the appropriate claimant.

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[2] The availability of derivative instruments dates back to well over a century. In, 1851, for example, the Chicago Board of Trade (CBOT) recorded the first forward contract involving 3,000 bushels of corn, while the first futures contract was recorded in 1865. However, it was not until 1972 that the Chicago Board Options Exchange (CBOE) introduced the first financial future, and not until 1973 that the Chicago Mercantile Exchange (CME) started trading stock options. Today, over 280 million contracts are traded on the CBOT, and over two trillion dollars of futures and options are traded on the CME annually.

Mian (1987), however, finds that firms do not hedge to reduce possible financial distress. He finds mixed evidence regarding the use of financial instruments for debt contracting, taxes, and cash flow uncertainty.

Relatively few studies have examined the direct relationship between the use of financial instruments and firm value.[3] Simkins (1998), Viswanathan (1998) and Aggarwal and Simkins (1999), for example, indicate that the use of financial instruments may lead to an increase in firm value. Allayannis and Weston (1998) also provide evidence from a sample of 720 nonfinancial firms from 1990 to 1995. They report that there is a positive relationship between currency derivative usage and Tobin's Q. Graham and Rogers (1999) also find that firm value is enhanced through the increase of debt capacity due to the use of financial instruments. These findings, however, contradict the conclusion suggested by Modigliani and Miller's (1958) seminal paper in which risk management strategies should be irrelevant to the value of the firm.[4]

In this paper, we further explore the relationship between firm value and derivative usage, with an emphasis on firms that are diversified along product lines. In the analysis, we gather data on over 1,600 firms headquartered in the U.S. during the 1991 through 1995 time period. We use a modification of the technique first adopted by Berger and Ofek (1995) to compute the implied value gain or loss from derivative usage on firm value. We find that focused firms that use derivative instruments have significantly higher unconditional average excess values than diversified firms that do not use them. After using regression procedures that control for firm characteristics including firm profitability, growth opportunities, size, leverage, and ownership concentration, We find that the value loss is greater for product diversified firms that

[3] The relative paucity of studies is partially due to the lack of detailed historical reporting of derivative instrument usage by firms. However, in response to the Financial Accounting Standards Board (FASB) requirements, the reporting of derivative instruments has improved considerably.

[4] According to Modigliani and Miller (1958), financing decisions are immaterial to the value of the firm ignoring taxes, transaction costs, and the cost of bankruptcy.

use derivatives, with the greatest value loss occurring for large diversified firms. These results are consistent with amplified agency costs in large, diversified firms. Using a Logit model to predict derivative usage, we also investigate how expected and unexpected derivative usage affects firm value. Interestingly, these results suggest that the value loss is associated with unexpected derivative usage by diversified firms. These findings also suggest that when firms use derivatives as expected, there are no valuation effects.

The balance of this paper is as follows. The next section describes the data and methodology. The results are provided in the third section, while section four extends those results. Section five provides a conclusion.

Data & Methodology

Description of Data

The Worldscope database is the principal data source used in this paper. The database discloses derivative information in the year-end financial statements. This information is mainly found in the footnotes to the firm's year-end statements. The derivative information is supplemented with 10-K reports from the SEC, which are available online through the EDGAR database.[5] The disclosure of derivative positions is mainly limited to the United States. Therefore, for my analysis, we concentrate on the 1991 through 1995 annual statements for firms in the United States.

We use the footnote information to classify the types of derivatives used by each firm. Specifically, we use a separate dummy variable for currency, interest rate, and commodity derivatives. We include a dummy variable for derivative usage to encompass any one of the above types of derivatives. Similar to Lins and Servaes (1999) and Fauver, Houston, and Naranjo (1999), we assign firms into categories based upon their two-digit SIC code. These categories are defined at both the industry and geographic level (domestic versus multinational). We use the segment sales in the appropriate category of the firm to identify the type of firm. The firm must

[5] The website is www.sec.gov/edgarhp.htm.

have more than 10% of their total sales in each appropriate product segment and/or regional segment to be considered a diversified firm. The sample excludes firms whose primary business is financial services (i.e., SICs in the 6000-6999 range). These firms are excluded because sales figures are irregularly reported and are difficult to interpret for financial institutions. Finally, the sample excludes private firms because calculating market value of equity requires stock prices.

Description of Methodology

We use the "chop-shop" approach to assess the effects of derivative usage on excess value, where excess value is based on a modification of the technique first adopted by Berger and Ofek (1995).[6] The ratio of total-capital-to-sales is used to measure firm value, where total capital is calculated by adding the market value of equity to the book value of debt. The difference between the firm's actual value and its imputed value is the measure of excess value. The actual value is determined by the consolidated firm's capital-to-sales ratio. The imputed value for single-segment domestic firms, not using derivatives, is measured as the median capital-to-sales ratio among all single-segment domestic firms, not using derivatives, within the same industry.[7] The imputed value for multi-segment firms using derivatives is measured by forming a weighted-average of the imputed values for each of the firm's segments, where the weights reflect the proportion of the overall firm's sales that come from each segment.

Multi-segment firms using derivatives with an actual value greater than their corresponding imputed value have a positive excess value (i.e., premium). Alternatively, multi-segment firms using derivatives with an actual value less than their corresponding imputed value have a negative excess value (i.e., discount). This occurs when a portfolio of pure-play firms, operating within the same industry, have a higher value relative to the multi-segment firms using derivatives. We group industries according to their two-digit SIC code level. The final sample

[6] Berger and Ofek (1995) consider two other ratios: the ratio of total capital (or price)-to-earnings and the ratio of total capital-to-assets. Their results are qualitatively similar for the three measures.

[7] I also obtain similar results when I stratify firms excluding the non-derivative usage restriction.

excludes excess values if the actual valuation is four times as large or one-fourth as large as the imputed valuation. This is common in previous studies and is used to eliminate nonsensical outliers from the sample.

Results

Unconditional Results

Table 4-1 reports descriptive statistics for firms by both industrial diversification and derivative usage. If a firm uses currency, interest rate, or commodity derivatives, then it is classified as a derivative-using firm. The top number in each cell of Table 4-1 is the mean for each variable, while the bottom number in parentheses is the corresponding median value for each respective variable. The panel to the right of Table 4-1 reports statistical tests for differences in the mean and median value for each variable across the four firm types (focused non-derivative using firms (1), diversified non-derivative using firms (2), focused derivative using firms (3), and diversified derivative using firms (4)).

There are some distinct differences that appear when comparing firms across the four categories in Table 4-1. The firms using derivatives are significantly larger as measured by total assets and total capital when compared to the firms not using derivatives. The order of magnitude is three to six times larger. Table 4-1 also shows that on every firm characteristic, excluding the market-to-sales ratio, firms using derivatives have significantly greater values than firms not using derivatives. In particular, firms using derivatives are more profitable as measured by the operating income-to-sales variable, have greater growth opportunities, and have higher leverage ratios. These findings are consistent with previous studies by Geczy, Minton, and Schrand (1997) and Graham and Rogers (1999).

The levels of ownership concentration reported in Table 4-1 also vary across the four firm types, with the highest ownership concentration for focused firms not using derivatives and the lowest ownership concentration for diversified firms that use derivatives. Several recent studies suggest that firm value is correlated with ownership structure through variations in agency

costs associated with ownership concentration [e.g., Demsetz and Lehn (1985), Morck, Shleifer and Vishny (1988), Holderness and Sheehan (1998), and McConnell and Servaes (1990)] and that ownership structure varies across countries and legal systems [e.g., La Porta, Lopez-de-Silanes, Shleifer and Vishny (1997, 1998), LaPorta, Lopez-De-Silanes and Shleifer (1999), and Claessens, Djankov, Fan and Lang (1998)]. Therefore, the low-level of ownership concentration among the diversified firms that use derivatives indicates that these firms face potentially higher agency costs and hence lower excess values. Consistent with this hypothesis, the mean and median excess values show that diversified firms who use derivatives experience the greatest value loss (approximately 9%). Interestingly, focused firms who use derivatives have the highest excess values. These results suggest that the effects of derivative usage on firm value potentially vary with the level of agency costs faced by the firm. Finally, the percentage of firms in the sample using derivatives is approximately 43%. This value is comparable to results reported in previous studies by Geczy, Minton, and Schrand (1997) and Allayannis and Weston (1998) who find that derivative usage by large firms ranges from 59 to 37 percent, respectively.[8]

Regression Results

Although the results reported in Table 4-1 indicate that diversified firms that use derivatives have the lowest excess values whereas focused firms that use derivatives have the highest excess values, these results do not control for individual firm characteristics known to affect the firm's market-to-sales ratio. These characteristics constitute the size of the firm, profitability, future growth opportunities, leverage, and ownership concentration as discussed by Berger and Ofek (1995), Lins and Servaes (1999), and Fauver, Houston and Naranjo (1999). To more clearly disentangle the effects of derivative usage on firm value, it is necessary to control

[8] Allayannis and Weston (1999) examine firms with more than 500 million in total assets and only currency derivative usage. Geczy, Minton, and Schrand (1997) explore derivative usage of the largest Fortune 500 firms as measured by sales. When I examine the largest firms in my sample (by sales and assets), I obtain similar results to those of Geczy, Minton, and Schrand (1997).

for these firm characteristics. Based on the previous literature, we estimate the following regression model:[9]

(1) $Excess\ Value = \alpha + \beta_1(Industrial\ Diversification\ Dummy)$

$+\beta_2(Geographic\ Diversification\ Dummy) + \beta_3(Derivative\ Usage\ Dummy)$

$+ \beta_4(Derivative\ Usage\ interacted\ with\ Industrial\ Diversification)$

$+ \beta_5(Derivative\ Usage\ interacted\ with\ Geographic\ Diversification)$

$+ \beta_6(Relative\ Operating\ Income/Sales) + \beta_7(Relative\ Capital\ Expenditures/Sales)$

$+ \beta_8(Log\ of\ Relative\ Assets) + \beta_9(Relative\ Leverage) + \beta_{10}(Ownership\ Concentration\ Levels)$

$+ e.$

Firm excess value, the dependent variable, is defined as the natural log of the ratio of the firm's market value to its imputed value. For the independent variables, the industrial diversification dummy, SEGI, is set to one if the firm reports operating in more than one business segment and equal to zero otherwise. Similarly, the geographic diversification dummy, GSEGI, is set to one if the firm reports operating in more than one country and equal to zero otherwise. The derivative usage dummy, DERIVDUM, is assigned a value of one if the firm reports derivative usage and a value of zero otherwise. The relative operating income-to-sales variable, OIS, provides a measure of the firm's relative profitability, where as the relative capital expenditures-to-sales, CES, provides a measure of relative growth opportunities. Previous studies have indicated that there exists a positive relationship between relative capital expenditures-to-sales and relative operating income-to-sales on excess value. The log of relative assets, ASSETS, variable controls for potential size differences in the sample. Relative leverage, RELLEV, controls for possible capital structure differences that may explain differences in the market-to-sales ratios. Since the dependent variable is measured in relative terms, We also measure the independent variables in relative terms. In particular, the independent variables are all measured

[9] The reported conclusions are also robust to alternative specifications as well.

relative to the value of the weighted-average multiplier firms that form the basis for the excess value measure.

Similar to Morck, Shleifer, and Vishny (1988) and others, we account for the nonlinear relation between ownership structure and its effect on firm value by creating three separate ownership concentration variables:[10]

OWN0to10 = *total ownership* if total ownership < 0.10,

= *0.10* if total ownership ≥ 0.10;

OWN10to30 = *0* if total ownership < 0.10,

= *total ownership minus 0.10* if 0.10 ≤ total ownership < 0.30,

= *0.20* if total ownership ≥ 0.30;

OWNover30 = *0* if total ownership < 0.30,

= *total ownership minus 0.30* if total ownership ≥ 0.30.

The exact link between ownership structure and firm value is not entirely clear. On one hand, it is widely acknowledged that concentrated ownership is likely to reduce the conflicts that arise when there is a separation between managers and stockholders. This link suggests a positive relation between firm value and ownership concentration. On the other hand, concentrated ownership provides large investors with opportunities to exploit minority shareholders, thereby suggesting at least for some range of values a negative relation between firm value and ownership concentration. Finally, the regression specification also contains individual year dummies to allow for variations in economic conditions throughout the sample period.

Table 4-2 summarizes the excess value regression results controlling for differences in firm characteristics. The estimated coefficients on the industrial diversification dummy and the

[10] Morck, Shleifer and Vishny (MSV, 1988) use 5 percent and 25 percent as their breakpoints. Given that the Worldscope databank does not generally provide firm level ownership concentration values below 5 percent (aside from the unreported values), I use a 10 percent cut-off for the first breakpoint and 30 percent as the next breakpoint to be consistent with MSV's ownership ranges.

geographic diversification dummy are consistent with earlier studies. In particular, looking at coefficients on SEGI and GSEGI, we find that the industrial diversification discount is 13.3% and the geographic diversification premium is 7.2%, both similar to earlier studies. These findings are consistent with the notion that, on average, product diversification is harmful to firm value and that geographic diversification is potentially beneficial.

The results also examine the effect of derivative usage on excess value. The regression results indicate that derivative usage has no effect on firm excess value as shown by the insignificant coefficient of DERIVDUM. Consistent with implications made by Modigliani and Miller's (1958), the insignificant effect of derivative usage on firm value indicates that derivative usage in and of itself neither enhances nor reduces firm value. Interestingly, when derivative usage is interacted with industrial diversification, there is a significant negative effect on firm value. This is consistent with the notion that for diversified firms that face potentially higher agency costs, derivative usage becomes a mechanism through which those costs are potentially enhanced.

The regressions also reveal a significant and positive effect for relative operating-income-to-sales, capital expenditures-to-sales and assets on excess value. This is consistent with larger, more profitable firms having a higher valuation as measured by their market-to-sales ratios. The coefficient of relative leverage is negative and significant in the regression. This indicates that firms with higher relative leverage as measured by total debt divided by total assets of the firm are valued less. The estimated coefficients for ownership concentration levels indicate that, for levels between ten and thirty percent, there is a negative effect on firm excess value, suggesting that entrenchment problems and expropriation of minority shareholders is more of a concern for firms with relatively low-levels of ownership concentration. Finally, the coefficients of the annual dummies, not included in the table, are insignificantly different from zero, indicating little conditional intertemporal variation in excess values over the sample period.

Turning to Table 4-3, we separate firms into size quartiles as measured by total assets and investigate the relations among excess value, derivative usage, industrial diversification and geographic diversification. Similar to Table 4-2, the results indicate that derivative usage has no effect on firm value. However, for large firms, diversified firms that use derivatives, there is a significant negative effect on firm value. This suggests that the agency costs associated with inappropriate derivative usage are of particular concern for large, diversified firms that face severe agency problems. The coefficients on the control variables are similar to those reported earlier. The following section examines the expected and unexpected portions of derivative usage to further explore the potential sources of the negative effect of derivative usage for diversified firms.

Results Separating Derivative Usage into Expected and Unexpected Components

The results reported in the section above indicate that derivative usage in and of itself does not appear to have any valuation effects. That is, there appears to be both benefits and costs associated with derivative usage. However, for diversified firms that use derivatives, there appears to be a negative valuation effect, consistent with additional agency costs. To further get at the source of the negative valuation effect, in this section we examine expected and unexpected derivative usage on firm value. We hypothesize that unexpected derivative usage by firms should result in higher agency costs and hence lower firm value, whereas expected derivative usage should have no effect on firm value. To derive expected and unexpected derivative usage, we use a Logit regression model with derivative usage as the dependent variable and variables shown to affect derivative usage as independent variables (e.g., Geczy, Minton, and Schrand (1997)). The estimated Logit regression is as follows:

(2) $\textit{Derivative Usage}_t = \alpha + \beta_1(\textit{Industrial Diversification Dummy})_{t-1}$

$+ \beta_2(\textit{Geographic Diversification Dummy})_{t-1} + \beta_3(\textit{Industrial and Geographic interaction})_{t-1}$

$+ \beta_4(\textit{Operating Income-to-Sales})_{t-1} + \beta_5(\textit{Capital Expenditure-to-Sales})_{t-1}$

$+ \beta_6(\textit{Log of Total Assets})_{t-1} + \beta_7(\textit{Leverage})_{t-1} + \beta_8(\textit{Ownership Levels})_{t-1} + e_t.$

Equation (2) is used to separate derivative usage into its expected and unexpected components. As with the earlier analysis, we use the footnote information to classify firms into derivative and non-derivative using firms. This binary indicator variable is used as the dependant variable in the Logit regression shown above. Similar to earlier studies, the independent variables are in levels and are for time t-1. The reason is that the expected and unexpected derivative usage of the firm at time t will be evaluated at time t-1, considering all relevant information is known at this time. The expected derivative usage portion is calculated from the predicted value from the Logit regression, and the unexpected derivative usage portion is the residual.[11] These results are summarized in Table 4-4. The results indicate that industrially diversified firms are more likely to use derivative instruments. Firms with greater growth opportunities, as measured by capital expenditures-to sales, are also more likely to use derivatives. Larger firms, as measured by total assets, are more likely the firm is to utilize derivatives. Higher levered firms are less likely to use derivatives. There is no effect on derivative usage for firms paying a dividend. Ownership levels appear to yield mixed results. Firms with lower concentrated ownership levels (defined below 10%) indicate a positive relationship for derivative usage, while firms with higher concentrated ownership levels (defined above 30%) are less likely to use derivatives.

The expected and unexpected values obtained from Table 4-4 regressions are now incorporated into equation (1). These results are shown in Table 4-5. The reported coefficient estimates are largely similar to those reported in Table 4-2. Interestingly, however, unexpected derivative usage by diversified firms has a significantly negative effect on firm value. This suggests that the negative valuation effects of derivative usage for diversified firms reported earlier is the result of unexpected derivative usage by these firms. Expected derivative usage, on the other hand, has no valuation effects for these firms and the other firms in the sample. This indicates that derivative usage, when expected, neither enhances nor reduces firm value. It is the

[11] I also calculated the equation using a Probit regression model. The correlations between the Logit and Probit models were almost one.

unexpected part of derivative usage by diversified firms, who likely face severe agency costs as a consequence of their organizational form, that are negatively effected.

Conclusion

In this paper, we investigate the effects of derivative usage on firm excess value as well as the interactions among derivative usage, product diversification, geographic diversification, and firm excess value. In the analysis, we gather data on over 1,600 firms headquartered in the U.S. during the 1991 through 1995 time period. We use a modification of the technique first adopted by Berger and Ofek (1995) to compute the implied value gain or loss from derivative usage on firm value. We find that focused firms that use derivative instruments have significantly higher unconditional average excess values than diversified firms that do not use them. After using regression procedures that control for firm characteristics including firm profitability, growth opportunities, size, leverage, and ownership concentration, we also find that the value loss is greater for product diversified firms that use derivatives, with the greatest value loss occurring for large diversified firms. Interestingly, results that differentiate between expected and unexpected derivative usage and control for individual firm characteristics suggest that the value loss is associated with unexpected derivative usage by diversified firms.

Overall, the findings in this paper suggest that diversified firms that potentially face higher agency costs are more likely to be negatively affected by derivative usage, particularly if they unexpectedly use them. On the other hand, the findings in this paper also suggest that derivative usage is not necessarily value enhancing nor value destroying. It is the interaction between firms that face potential agency costs and derivative usage that are of particular concern. In sum, it appears that there are both benefits and costs associated with derivative usage. To mitigate the costs, it is important that derivative usage by firms be closely monitored.

Table 4-1
Summary Statistics for U.S. Firms by Industrial Diversification (SEGI) and Derivative Usage: 1991 – 1995

Firm Level Characteristics by Derivative Usage	Firms Not Using Derivatives		Firms Using Derivatives	
	SEGI = 0	SEGI = 1	SEGI = 0	SEGI = 1
	(1)	(2)	(3)	(4)
Total Assets (mil $)	795	645	2,810	4,210
	(176)	(283)	(730)	(1,580)
Total Capital (mil $)	538	436	1,710	2,480
	(120)	(191)	(484)	(979)
Leverage Ratio	0.259	0.264	0.274	0.289
	(0.240)	(0.250)	(0.252)	(0.276)
Operating Income/Sales	0.117	0.113	0.177	0.151
	(0.122)	(0.114)	(0.147)	(0.135)
Capital Expenditure/Sales	0.085	0.074	0.114	0.088
	(0.048)	(0.042)	(0.059)	(0.053)
Research & Development (mil $)	6.0	6.9	87.9	156
	(0.4)	(0.6)	(11.4)	(23.8)
Market/Sales	1.849	1.322	1.701	1.351
	(1.160)	(0.960)	(1.245)	(1.014)
Ownership Concentration	0.296	0.268	0.252	0.197
	(0.264)	(0.234)	(0.205)	(0.143)
Excess Value	0.023	-0.089	0.097	-0.088
	(0.001)	(-0.082)	(0.107)	(-0.091)
Observations	3,012	847	1,849	1,012

Table 4-1—continued

Firm Level Characteristics by Derivative Usage	Test of Statistical Differences p-values					
	(1) – (2)	(1) – (3)	(1) – (4)	(2) – (3)	(2) – (4)	(3) – (4)
Total Assets (mil $)	0.007	0.000	0.000	0.000	0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Total Capital (mil $)	0.007	0.000	0.000	0.000	0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Leverage Ratio	0.503	0.013	0.000	0.250	0.005	0.035
	(0.127)	(0.002)	(0.000)	(0.483)	(0.000)	(0.000)
Operating Income/Sales	0.698	0.000	0.000	0.000	0.000	0.000
	(0.035)	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)
Capital Expenditure/Sales	0.009	0.000	0.503	0.000	0.007	0.000
	(0.359)	(0.000)	(0.000)	(0.000)	(0.000)	(0.027)
Research & Development (mil $)	0.204	0.000	0.000	0.000	0.000	0.000
	(0.112)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Market/Sales	0.000	0.023	0.000	0.000	0.618	0.000
	(0.000)	(0.002)	(0.002)	(0.000)	(0.006)	(0.000)
Ownership Concentration	0.003	0.000	0.000	0.096	0.000	0.000
	(0.002)	(0.000)	(0.000)	(0.031)	(0.000)	(0.000)
Excess Value	0.000	0.000	0.000	0.000	0.956	0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.864)	(0.000)
Observations						

Derivative usage includes currency, interest rate, and commodity derivatives. The upper number in each cell reports the mean value for each variable, while the lower number in parentheses reports the median value for each variable. T-tests are used to test for differences in each respective mean value, while a Wilcoxon rank-sum test is used to test for differences in the median values. The leverage ratio is defined as book value of debt divided by total assets. Due to missing R&D data, the observations are slightly less than for the other variables. Market-to-sales is defined as the ratio of a firm's market value of equity plus book value of debt to its total sales.

Table 4-2
Multivariate Regression Estimates of Excess Values for Derivative Usage Controlling for Firm Characteristics: 1991 - 1995

Variables	Excess Value Regression
Constant	0.015 (0.574)
Multi-Industry Segment Dummy (SEGI)	-0.133*** (-6.162)
Multi-Country Segment Dummy (GSEGI)	0.072** (2.497)
Derivative Dummy (DERIVDUM)	0.007 (0.347)
Derivative Dummy interacted with SEGI (SDERIV)	-0.072** (-2.323)
Derivative Dummy interacted with GSEGI (GDERIV)	-0.062 (-1.374)
Relative Operating Income-to-Sales (OIS)	0.006*** (2.631)
Relative Capital Expenditures-to-Sales (CES)	0.047*** (6.128)
Relative Total Assets (ASSETS)	0.083*** (6.765)
Relative Leverage (RELLEV)	-0.041*** (-6.269)
Ownership Concentration < 10 (OWN0to10)	0.213 (0.868)
Ownership Concentration 10-30 (OWN10to30)	-0.316** (-2.332)
Ownership Concentration > 30 (OWNover30)	0.060 (0.929)
Adjusted R^2	0.066
Number of Observations	6,720

Significant at 1 percent (***), 5 percent (**), and 10 percent (*) levels; Robust-White t-statistics in parentheses.

Regression estimates are from 1991-1995. Excess value is defined as the natural logarithm of the ratio of a firm's market-to-sales ratio to its imputed market-to-sales ratio. Firms with excess values that are greater than four or less than one-fourth are eliminated from the sample. The industry diversification dummy, SEGI, is equal to one for firms who operate in more than one industry and zero otherwise. Multi-industry firms are defined as firms that operate in two or more two-digit SIC code industries and no firm segment sales exceed 90% of total firm sales. The multi-country diversification dummy, GSEGI, is equal to one for firms who operate in more than one country and zero otherwise. Multi-country firms are defined as firms that operate in two or more countries and no firm segment sales in a particular country exceed 90% of total firm sales. Derivative usage includes currency, interest rate, and commodity derivatives. OIS is defined as the firm's operating income-to-sales, while CES is the firm's capital expenditures-to-sales. Assets

are defined as the natural logarithm of the firm's total assets. The leverage ratio is defined as book value of debt divided by total assets. OIS, CES, and ASSETS are all measured relative to the value of the weighted-average multiplier firms that form the basis for the excess value measure. Ownership concentration is defined as the sum of individual and/or institutional ownership holdings that are equal to or exceed five percent of a firm's common stock. OWN0to10: = *total ownership* if total ownership < 0.10, = *0.10* if total ownership ≥ 0.10; OWN10to30: = *0* if total ownership < 0.10, = *total ownership minus 0.10* if $0.10 \leq$ total ownership < 0.30, = *0.20* if total ownership ≥ 0.30; OWNover30: = *0* if total ownership < 0.30, = *total ownership minus 0.30* if total ownership ≥ 0.30. The model specification also includes year dummies for 1992-1995.

Table 4-3
Multivariate Regression Estimates of Excess Values for Derivative Usage by Firm Size:
1991 - 1995

Variables	Asset Size Quartile			
	Small	(2)	(3)	Large
Constant	-0.012	-0.079*	-0.024	0.222***
	(-0.195)	(-1.488)	(-0.488)	(4.747)
Multi-Industry Segment Dummy	-0.174***	-0.152***	-0.110***	-0.043
(SEGI)	(-4.145)	(-3.838)	(-2.638)	(-0.901)
Multi-Country Segment Dummy	0.060	0.101*	0.144***	-0.138**
(GSEGI)	(1.229)	(1.857)	(2.711)	(-2.182)
Derivative Dummy	0.018	-0.040	0.045	-0.001
(DERIVDUM)	(0.353)	(-0.989)	(1.222)	(-0.040)
Derivative Dummy interacted	-0.138	-0.068	-0.086	-0.126**
with SEGI (SDERIV)	(-1.610)	(-0.898)	(-1.466)	(-2.195)
Derivative Dummy interacted	-0.216*	-0.005	-0.091	0.107
with GSEGI (GDERIV)	(-1.877)	(-0.046)	(-1.205)	(1.281)
Relative Operating Income-to-	0.023**	0.006	0.010	0.003*
Sales (OIS)	(2.419)	(1.328)	(0.951)	(1.719)
Relative Capital Expenditures-to-	0.070***	0.052***	0.054***	0.027***
Sales (CES)	(4.501)	(3.299)	(4.011)	(3.198)
Relative Total Assets (ASSETS)	0.040	0.111***	0.082**	-0.027
	(0.927)	(2.673)	(2.296)	(-1.032)
Relative Leverage (RELLEV)	-0.051***	-0.018*	-0.030**	-0.061***
	(-4.753)	(-1.772)	(-2.400)	(-5.846)
Ownership Concentration < 10	1.252*	0.426	0.404	-0.721*
(OWN0to10)	(1.893)	(0.716)	(0.823)	(-1.794)
Ownership Concentration 10-30	-1.176***	-0.257	-0.110	0.392
(OWN10to30)	(-4.080)	(-0.959)	(-0.435)	(1.372)
Ownership Concentration > 30	0.149	0.043	-0.118	0.241*
(OWNover30)	(1.133)	(0.345)	(-1.057)	(1.663)
Adjusted R^2	0.106	0.066	0.070	0.064
Number of Observations	1,680	1,680	1,680	1,680

Significant at 1 percent (***), 5 percent (**), and 10 percent (*) levels; Robust-White t-statistics in parentheses.

Regression estimates are from 1991-1995. The small quartile category comprises the smallest firms as measured by log of total assets, whereas the large category comprises the largest firms. Excess value is defined as the natural logarithm of the ratio of a firm's market-to-sales ratio to its imputed market-to-sales ratio. Firms with excess values that are greater than four or less than one-fourth are eliminated from the sample. The industry diversification dummy, SEGI, is equal to one for firms who operate in more than one industry and zero otherwise. Multi-industry firms are defined as firms that operate in two or more two-digit SIC code industries and no firm segment sales exceed 90% of total firm sales. The multi-country diversification dummy, GSEGI, is equal to one for firms who operate in more than one country and zero otherwise. Multi-country firms are defined as firms that operate in two or more countries and no firm segment sales in a particular country exceed 90% of total firm sales. Derivative usage includes currency, interest rate, and commodity derivatives. OIS is defined as the firm's operating income-to-sales, while

CES is the firm's capital expenditures-to-sales. Assets are defined as the natural logarithm of the firm's total assets. The leverage ratio is defined as book value of debt divided by total assets. OIS, CES, and ASSETS are all measured relative to the value of the weighted-average multiplier firms that form the basis for the excess value measure. Ownership concentration is defined as the sum of individual and/or institutional ownership holdings that are equal to or exceed five percent of a firm's common stock. OWN0to10: = *total ownership* if total ownership < 0.10, = *0.10* if total ownership ≥ 0.10; OWN10to30: = *0* if total ownership < 0.10, = *total ownership minus 0.10* if $0.10 \leq$ total ownership < 0.30, = *0.20* if total ownership ≥ 0.30; OWNover30: = *0* if total ownership < 0.30, = *total ownership minus 0.30* if total ownership ≥ 0.30. The model specification also includes year dummies for 1992-1995.

Table 4-4
Logit Regression Estimates of Derivative Usage: 1992 – 1995

Variables	Derivative Usage Dummy
Constant	-13.226***
	(-26.366)
Multi-Industry Segment Dummy (SEGI)	0.362***
	(4.814)
Multi-Country Segment Dummy (GSEGI)	0.046
	(0.373)
Industry Segment Dummy interacted with Country dummy (SEGIGSEGI)	0.021
	(0.098)
Operating Income-to-Sales (OIS)	0.225
	(1.602)
Capital Expenditures-to-Sales (CES)	0.382
	(1.137)
Log Total Assets (ASSETS)	1.469***
	(25.363)
Leverage (LEV)	-0.335**
	(-2.102)
Dividend Dummy (DIVDUM)	-0.010
	(-0.135)
Ownership Concentration < 10 (OWN0to10)	2.633**
	(2.272)
Ownership Concentration 10-30 (OWN10to30)	0.251
	(0.410)
Ownership Concentration > 30 (OWNover30)	-0.480*
	(-1.783)
Pseudo R^2	0.166
Number of Observations	5,186

Significant at 1 percent (***), 5 percent (**), and 10 percent (*) levels; Robust-White t-statistics in parentheses.

Estimates based on the following Logit regression equation:

$$\text{Derivative Usage}_t = \alpha + \beta_1(\text{Industrial Diversification Dummy})_{t-1} + \beta_2(\text{Geographic Diversification Dummy})_{t-1} + \beta_3(\text{Industrial and Geographic interaction})_{t-1} + \beta_4(\text{Operating Income-to-Sales})_{t-1} + \beta_5(\text{Capital Expenditure-to-Sales})_{t-1} + \beta_6(\text{Log of Total Assets})_{t-1} + \beta_7(\text{Leverage})_{t-1} + \beta_8(\text{Dividend Dummy})_{t-1} + \beta_9(\text{Ownership Concentration Levels})_{t-1} + e_t.$$

Logit regression estimates are from 1991-1995. Derivative usage includes currency, interest rate, and commodity derivatives. The industry diversification dummy, SEGI, is equal to one for firms who operate in more than one industry and zero otherwise. Multi-industry firms are defined as firms that operate in two or more two-digit SIC code industries and no firm segment sales exceed 90% of total firm sales. The multi-country diversification dummy, GSEGI, is equal to one for firms who operate in more than one country and zero otherwise. Multi-country firms are defined as firms that operate in two or more countries and no firm segment sales in a particular country exceed 90% of total firm sales. OIS is defined as the firm's operating income-to-sales, while

CES is the firm's capital expenditures-to-sales. Assets are defined as the natural logarithm of the firm's total assets. The leverage ratio is defined as book value of debt divided by total assets. Dividend dummy is equal to one if the firm paid a dividend and zero otherwise. Ownership concentration is defined as the sum of individual and/or institutional ownership holdings that are equal to or exceed five percent of a firm's common stock. OWN0to10: = *total ownership* if total ownership < 0.10, = *0.10* if total ownership ≥ 0.10; OWN10to30: = *0* if total ownership < 0.10, = *total ownership minus 0.10* if $0.10 \leq$ total ownership < 0.30, = *0.20* if total ownership ≥ 0.30; OWNover30: = *0* if total ownership < 0.30, = *total ownership minus 0.30* if total ownership ≥ 0.30. The model specification also includes year dummies for 1993-1995.

Table 4-5
Multivariate Regression Estimates of Excess Values for Expected and Unexpected Derivative Usage Controlling for Firm Characteristics: 1992 – 1995

Variables	Excess Value Regression
Constant	-0.008 (-0.198)
Multi-Industry Segment Dummy (SEGI)	-0.159*** (-3.547)
Multi-Country Segment Dummy (GSEGI)	0.008 (0.146)
Expected Derivative Usage	-0.040 (-0.565)
Unexpected Derivative Usage	0.004 (0.381)
Expected Derivative Usage Dummy interacted with SEGI (SDERVEXP)	-0.002 (-0.027)
Unexpected Derivative Usage Dummy interacted with SEGI (SDERVUNEX)	-0.044** (-2.559)
Expected Derivative Usage Dummy interacted with GSEGI (GDERVEXP)	0.067 (0.557)
Unexpected Derivative Usage Dummy interacted with GSEGI (GDERVUNEX)	-0.023 (-0.917)
Relative Operating Income-to-Sales (OIS)	0.005*** (2.596)
Relative Capital Expenditures-to-Sales (CES)	0.047*** (5.422)
Relative Total Assets (ASSETS)	0.099*** (4.593)
Relative Leverage (RELLEV)	-0.034*** (-4.585)
Ownership Concentration < 10 (OWN0to10)	0.164 (0.588)
Ownership Concentration 10-30 (OWN10to30)	-0.365** (-2.443)
Ownership Concentration > 30 (OWNover30)	0.058 (0.787)
Adjusted R^2	0.067
Number of Observations	5,186

Significant at 1 percent (***), 5 percent (**), and 10 percent (*) levels, Robust-White t-statistics in parentheses.

Excess value is defined as the natural logarithm of the ratio of a firm's market-to-sales ratio to its imputed market-to-sales ratio. Firms with excess values that are greater than four or less than one-fourth are eliminated from the sample. The industry diversification dummy, SEGI, is equal

to one for firms who operate in more than one industry and zero otherwise. Multi-industry firms are defined as firms that operate in two or more two-digit SIC code industries and no firm segment sales exceed 90% of total firm sales. The multi-country diversification dummy, GSEGI, is equal to one for firms who operate in more than one country and zero otherwise. Multi-country firms are defined as firms that operate in two or more countries and no firm segment sales in a particular country exceed 90% of total firm sales. Expected and unexpected derivative usage are based on the estimates from Table 4-4. OIS is defined as the firm's operating income-to-sales, while CES is the firm's capital expenditures-to-sales. Assets are defined as the natural logarithm of the firm's total assets. The leverage ratio is defined as book value of debt divided by total assets. OIS, CES, and ASSETS are all measured relative to the value of the weighted-average multiplier firms that form the basis for the excess value measure. Ownership concentration is defined as the sum of individual and/or institutional ownership holdings that are equal to or exceed five percent of a firm's common stock. OWN0to10: = *total ownership* if total ownership < 0.10, = *0.10* if total ownership ≥ 0.10; OWN10to30: = *0* if total ownership < 0.10, = *total ownership minus 0.10* if $0.10 \leq$ total ownership < 0.30, = *0.20* if total ownership ≥ 0.30; OWNover30: = *0* if total ownership < 0.30, = *total ownership minus 0.30* if total ownership ≥ 0.30. The regression specification also includes year dummies for 1993-1995.

CHAPTER 5
DISCUSSION AND CONCLUSION

We first find that the negative value associated with product diversification in the U.S., does not necessarily hold in less developed countries. Specifically, we conclude that there is an inverse relationship between the value of product diversification and the level of capital market development. We also determine that the value of product diversification varies with the legal system in the country where the firm is headquartered. These results indicate that the environment in which the firm operates plays a part on the value of the firm.

Secondly, we determine the effect of product and geographic diversification on firm value. We find that on average, geographic diversification has no effect on firm value in Germany and the United Kingdom. There is, however, a benefit to geographic diversification in Japan and the United States. This leads one to believe that firms operating within these countries are generating greater operating efficiencies or greater risk reduction. However, firms in these four countries achieve no greater benefit than an international portfolio of domestic firms operating in their line of business.

Finally, unconditional derivative usage by focused firms has a positive effect on firm excess value, and a negative effect on industrially diversified firms. Results controlling for firm characteristics indicate that derivative usage by industrially diversified firms has a negative effect on firm value. The negative effect is greater for larger, diversified firms. The results differentiating between expected and unexpected derivative usage indicate that unexpected derivative usage by industrially diversified firms has a negative effect on firm value, while, expected derivative usage in itself has no valuation effect on firm value. These findings are consistent with greater agency costs associated with product diversified firms. Therefore, managers and shareholders should carefully monitor potential agency costs associated with diversified firms.

REFERENCES

Aggarwal, Raj and Betty Simkins, 1999, "Voluntary Disclosures of Derivative Usage: Evidence and Determinants for US Companies," Oklahoma State University Working Paper.

Allayannis, George and James Weston, 1998, "The Use of Foreign Currency Derivatives and Firm Market Value," University of Virginia Working Paper.

Bekaert, Geert and Campbell Harvey, 1995, Time-Varying World Market Integration, *Journal of Finance*, 50, 403-444.

Berger, Philip and Eli Ofek, 1995, Diversification's Effect on Firm Value, *Journal of Financial Economics*, 37, 39-65.

Bodnar, Gordon and William Gentry, 1993, "Exchange Rate Exposure and Industry Characteristics: Evidence from Canada, Japan, and the USA," *Journal of International Money and Finance*, 12, 29-45.

Bodnar, Gordon, Tang, Charles, and Joseph Weintrop, 1998, Both Sides of Corporate Diversification: The Value Impacts of Geographic and Industrial Diversification, University of Pennsylvania Working Paper.

Breeden, Douglas and S. Viswanathan, 1990, "Why Do Firms Hedge? An Asymmetric Information Model," Duke University Working Paper.

Campbell, John, 1996, Understanding Risk and Return, *Journal of Political Economy,* 104, 298-345.

Chen, Zhiwu and Peter Knez, 1995, Measurement of Market Integration and Arbitrage, *Review of Financial Studies*, 8, 287-325.

Cho, D. Chinhyung, Eun, Cheol and Lemma Senbet, 1986, International Arbitrage Pricing Theory: An Empirical Investigation, *Journal of Finance*, 41, 313-329.

Claessens, Stijn, Simeon Djankov, Joseph Fan and Larry Lang, 1998, Ownership Structure and Corporate Performance in East Asia, Hong Kong University of Science and Technology Working Paper.

Comment, Robert and Gregg Jarrell, 1995, Corporate Focus and Stock Returns, *Journal of Financial Economics*, 37, 67-87.

Cooper, Ian and Evi Kaplanis, 1994, Home Bias in Equity Portfolios, Inflation Hedging, and International Capital Market Equilibrium, *Review of Financial Studies*, 7, 45-60.

DeMarzo, Peter and Darrell Duffie, 1995, "Corporate Incentives for Hedging and Hedge Accounting," *Review of Financial Studies*, 8, 743-771.

Demirgüc-Kunt, Asli and Vojislav Maksimovic, 1996, Financial Constraints, Uses of Funds and Firm Growth: An International Comparison, University of Maryland Working Paper.

Demsetz, Harold and Kenneth Lehn, 1985, The Structure of Corporate Ownership: Causes and Consequences, *Journal of Political Economy*, 93, 1155-1177.

Denis, David, Denis, Diane, and Atulya Sarin, 1997, Agency problems, Equity Ownership, and Corporate Diversification, *Journal of Finance*, 52, 135-160.

Denis, David, Denis, Diane, and Keven Yost, 1999, Geographic Diversification, Industrial Diversification, and Firm Value, Purdue University Working Paper.

Desai, Mihir, 1997, A Multinational Perspective on Capital Structure Choice and Internal Capital Markets, Harvard University Working Paper.

Errunza, Vihang and Lemma Senbet, 1981, The Effects of International Operations on the Market Value of the Firm: Theory and Evidence, *Journal of Finance*, 36, 401-417.

Errunza, Vihang and Lemma Senbet, 1984, International Corporate Diversification, Market Valuation, and Size-Adjusted Evidence, *Journal of Finance*, 39, 727-745.

Fauver, Larry, Houston, Joel, and Andy Naranjo, 1999, Capital Market Development, Legal Systems and the Value of Corporate Diversification: A Cross-Country Analysis, University of Florida Working Paper.

Fauver, Larry, Houston, Joel and, Andy Naranjo, 2000, "Firm Level Evidence on the Value of International Diversification," University of Florida Working Paper.

French, Kenneth and James Poterba, 1991, Investor Diversification and International Equity Markets, *The American Economic Review*, 81, 222-226.

Froot, Kenneth, Scharfstein, David, and Jeremy Stein, 1993, "Risk Management: Coordinating Corporate Investment and Financing Policies," *Journal of Finance*, 48, 1629-1658.

Gao, Ting, 2000, "Exchange Rate Movements and the Profitability of U.S. Multinationals," *Journal of International Money and Finance*, 19, 117-134.

Geczy, Christopher, Minton, Bernadette, and Catherine Schrand, 1997, "Why Firms Use Currency Derivatives," *Journal of Finance*, 52, 1323-1354.

Gertner, Robert, Scharfstein, David and Jeremy Stein, 1994, Internal versus External Capital Markets, *Quarterly Journal of Economics*, 109, 1211-1230.

Graham, John and Daniel Rogers, 1999, "Is Corporate Hedging Consistent with Value Maximization? An Empirical Analysis," Duke University Working Paper.

Griffin, John and Andrew Karolyi,1998, Another Look at the Role of the Industrial Structure of Markets for International Diversification Strategies, *Journal of Financial Economics*, 50, 351-373.

Gultekin, Mustafa, Gultekin, N. Bulent and Alessandro Penati, 1989, Capital Controls and International Capital Market Segmentation: The Evidence from the Japanese and American Stock Markets, *Journal of Finance*, 44, 849-869.

Hadlock, Charles, Ryngaert, Michael and Shawn Thomas, 1998, Corporate Structure and Equity Offerings: Are there Benefits to Diversification?, University of Florida Working Paper.

Harris, Milton and Arthur Raviv, 1996, The Capital Budgeting Process, Incentives and Information, *Journal of Finance,* 51, 1139-1174.

Haushalter, David, 2000, "Financing Policy, Basis Risk, and Corporate Hedging: Evidence from Oil and Gas Producers," *Journal of Finance*, 55, 107-152.

Heston, Steven and K. Geert Rouwenhorst, 1994, Does Industrial Structure Explain the Benefits of International Diversification?, *Journal of Financial Economics* 36, 3-27.

Hite, Gailen and James Owers, 1983, Security Price Reactions Around Corporate Spin-off Announcements, *Journal of Financial Economics,* 12, 409-436.

Houston, Joel, James, Christopher and David Marcus, 1997, Capital Market Frictions and the Role of Internal Capital Markets in Banking, *Journal of Financial Economics,* 46, 135-164.
Holderness, Clifford and Dennis Sheehan, 1998, Constraints on Large-Block Shareholders, NBER Working Paper #6765.

Hubbard, Glenn and Darius Palia, 1998, A Re-examination of the Conglomerate Wave in the 1960s: An Internal Capital Market View, forthcoming, *Journal of Finance.*

Jensen, Michael, 1986, Agency Costs of Free Cash Flow, Corporate Finance, and Takeovers, *American Economic Review*, 76, 323-329.

Jensen, Michael, 1991, Corporate Control and the Politics of Finance, *Journal of Applied Corporate Finance,* 4, 13-33.

Jensen, Michael, 1993, The Modern Industrial Revolution, Exit and the Failure of Internal Control Systems, *Journal of Finance*, 48, 831-880.

John, Kose and Eli Ofek, 1995, Asset Sales and Increase in Focus, *Journal of Financial Economics,* 37, 105-126.

Jorion, Phillipe and Eduardo Schwartz, 1986, Integration versus Segmentation in the Canadian Stock Market, *Journal of Finance*, 41, 603-613.

Kaplan, Steven and Michael Weisbach, 1992, The Success of Acquisitions: Evidence from Divestitures, *Journal of Finance,* 47, 107-138.

Kim, E. Han and John McConnell, 1977, Corporate Mergers and the Co-insurance of Corporate Debt, *Journal of Finance*, 32, 349-365.

Kim, Wi Saeng and Esmeralda Lyn, 1986, Excess Market Value, The Multinational Corporation, and Tobin's q-Ratio, *Journal of International Business Studies*, 119-126.

Khanna, Tarun, and Krishna Palepu, 1997, Corporate Scope and Institutional Context: An Empirical Analysis of Diversified Indian Business Groups, Harvard Business School Working Paper.

King, Robert and Ross Levine, 1993a, Finance and Growth: Schumpeter May be Right, *Quarterly Journal of Economics*, 108, 717-737.

King, Robert and Ross Levine, 1993b, Finance, Entrepreneurship, and Growth: Theory and Evidence, *Journal of Monetary Economics*, 32, 513-542.

Klein, Peter, 1998, Were the Conglomerates Inefficient? A Reconsideration, Working Paper University of Georgia.

Lamont, Owen, 1997, Cash Flow and Investment: Evidence from Internal Capital Markets, *Journal of Finance*, 52, 83-109.

Lamont, Owen and Christopher Polk, 1999, The Diversification Discount: Cash Flows vs. Returns, University of Chicago Working Paper.

Lang, Larry, and Rene Stulz, 1994, Tobin's q, Corporate Diversification and Firm Performance, *Journal of Political Economy*, 102, 1248-1280.

La Porta, Rafael, Lopez-de-Silanes, Florencio, Shleifer, Andrei, and Robert Vishny, 1997, Legal Determinants of External Finance, *Journal of Finance*, 52, 1131-1150.

La Porta, Rafael, Lopez-de-Silanes, Florencio, Shleifer, Andrei, and Robert Vishny, 1998, Law and Finance, *Journal of Political Economy*, 106, 1115-1155.

La Porta, Rafael, Lopez-de-Silanes, Florencio, and Andrei Shleifer, 1999, Corporate Ownership Around the World, *Journal of Finance*, 54, 471-517.

Levich, Richard, Hayt, Gregory, and Beth Ripston 1999, "1998 Survey of Derivatives and Risk Management Practices by U.S. Institutional Investors," New York University Working Paper.

Levine, Ross, 1997, Financial Development and Economic Growth: Views and Agenda, *Journal of Economic Literature*, 35, 688-726.

Lewellen, Wilbur, 1971, A Pure Financial Rationale for the Conglomerate Merger, *Journal of Finance*, 26, 521-537.

Lins, Karl and Henri Servaes, 1999, International Evidence on the Value of Corporate Diversification, *Journal of Finance*, 54, 2215-2239.

Lins, Karl, and Henri Servaes, 1998, Is Corporate Diversification Beneficial in Emerging Markets?, University of North Carolina Working Paper.

Loderer, Claudio and Karl Pichler, 2000, "Firms, Do You Know Your Currency Risk Exposure? Survey Results, Bern University Working Paper.

Mayers, David and Clifford Smith, 1982, "On the Corporate Demand for Insurance," *Journal of Business,* 55, 281-296.

Mayers, David and Clifford Smith, 1987, "Corporate Insurance and the Underinvesment Problem," *Journal of Risk and Insurance*, 54, 45-54.

McConnell, John and Henri Servaes, 1990, Additional Evidence on Equity Ownership and Corporate Value, *Journal of Financial Economics*, 27, 595-612.

Mian, Shehzad, 1996, "Evidence on Corporate Hedging Policy," *Journal of Financial and Quantitative Analysis*, 31, 419-439.

Mittoo, Usha, 1992, Additional Evidence on Integration in the Canadian Stock Market, *Journal of Finance*, 47, 2035-2054.

Modigliani, Franco and Merton Miller, 1958, "The Cost of Capital, Corporation Finance and the Theory of Investment," *American Economic Review*, 48, 261-297.

Morck, Randall, Shleifer, Andrei, and Robert Vishny, 1988, Management Ownership and Market Valuation: An Empirical Analysis, *Journal of Financial Economics*, 20, 293-315.

Morck, Randall and Bernard Yeung, 1991, Why Investors Value Multinationality, *Journal of Business*, 64, 165-187.

Morck, Randall and Bernard Yeung, 1998, Why Firms Diversify: Internalization vs. Agency Behavior, University of Michigan Working Paper.

Myers, Stuart, 1977, "Determinants of Corporate Borrowing," *Journal of Financial Economics*, 5, 147-175.

Nance, Deana, Smith Jr., Clifford, and Charles Smithson, 1993, "On the Determinants of Corporate Hedging," *Journal of Finance*, 48, 267-284.

Naranjo, Andy and Aris Protopapadakis, 1997, Financial Market Integration Tests: An Investigation Using U.S. Equity Markets, *Journal of International Financial Markets, Institutions and Money*, 7, 93-135.

Rajan, Raghuram and Luigi Zingales, 1996a, Financial Dependence and Growth, NBER Working Paper.

Rajan, Raghuram, and Luigi Zingales, 1996b, The Tyranny of the Inefficient: An Inquiry into the Adverse Consequences of Power Struggles, University of Chicago Working Paper.

Rajan, Raghuram, Servaes, Henri and Luigi Zingales, 1997, The Cost of Diversity: Diversification Discount and Inefficient Investment, University of Chicago and the University of North Carolina, Chapel Hill Working Paper.

Roll, Richard, 1992, Industrial Structure and the Comparative Behavior of International Stock Market Indices, *Journal of Finance*, 47, 3-42.

Rowland, Partick and Linda Tesar, 1998, Multinationals and the Gains from International Diversification, NBER Working Paper #6733.

Scharfstein, David, 1998, The Dark Side of Internal Capital Markets II: Evidence from Diversified Conglomerates, NBER Working Paper.

Scharfstein, David, and Jeremy Stein, 1997, The Dark Side of Internal Capital Markets: Divisional Rent-Seeking and Inefficient Investment, NBER Working Paper.

Schipper, Katherine and Abbie Smith, 1983, Effects of Recontracting on Shareholder Wealth: The Case of Voluntary Spin-offs, *Journal of Financial Economics,* 12, 437-467.

Servaes, Henri, 1996, The Value of Diversification during the Conglomerate Merger Wave, *Journal of Finance*, 51, 1201-1225.

Shin, Hyun-Han and Rene Stulz, 1997, Are Internal Capital Markets Efficient?, Ohio State University Working Paper.

Simkins, Betty, 1997, "Asymmetric Information, Credit Quality and the Use of Interest Rate Derivatives," Oklahoma State University Working Paper.

Smith, Clifford and Rene Stulz, 1985 "The Determinants of Firms' Hedging Policies," *Journal of Financial and Quantitative Analysis*, 20, 391-405.

Stein, Jeremy, 1997, Internal Capital Markets and the Competition for Corporate Resources, *Journal of Finance*, 52, 111-133.

Stulz, Rene, 1984, "Optimal Hedging Policies," *Journal of Financial and Quantitative Analysis*, 19, 127-140.

Stulz, Rene, 1990, Managerial Discretion and Optimal Financing Policies, *Journal of Financial Economics*, 26, 3-27.

Stulz, Rene, 1999, Globalization of Equity Markets and the Cost of Capital, NBER Working Paper # 7021.

Tufano, Peter, 1996, "Who Manages Risk? An Empirical Examination of Risk Management Practices in the Gold Mining Industry," *Journal of Finance*, 51, 1097-1137.

Visvanathan, Gnanakumar, 1998, "Who Uses Interest Rate Swaps? A Cross-Sectional Analysis," *Journal of Accounting, Auditing, and Finance*, Summer, 173-200.

Wheatley, Simon, 1988, Some Tests of International Equity Integration, *Journal of Financial Economics*, 21, 177-212.

Williamson, Oliver, 1975, Markets and Hierarchies, Analysis and Antitrust Implications: A Study in the Economics of Internal Organization, Collier Macmillan Publishers, Inc., New York, NY.

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Larry A. Fauver was born in Youngstown, Ohio in 1969. He received his B.E. in mechanical engineering at Youngstown State University in 1992. He then received an MBA in general business at Youngstown State University in 1994. In 1995, he started his Ph.D. at the University of Florida. In 1997, he received an M.A. in economics. He will graduate in August 2000 and continue his career in the finance department at the University of Miami as an assistant professor.

I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Philosophy.

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I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Philosophy.

Mark J. Flannery
Barnett Bank Eminent Scholar of Finance, Insurance, and Real Estate

I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Philosophy.

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This dissertation was submitted to the Graduate Faculty of the Department of Finance, Insurance, and Real Estate in the Warrington College of Business Administration and to the Graduate School and was accepted as partial fulfillment of the requirements for the degree of Doctor of Philosophy.

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